DAVID Y. IGE
Governor

SHAN S. TSUTSUI
Lt. Governor

FILE COPY

APR 23 2016

SCOTT E. ENRIGHT
Chairperson, Board of Agriculture

PHYLLIS SHIMABUKURO-GEISER
Deputy to the Chairperson

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512
Phone: (808) 973-9600 FAX: (808) 973-9613

April 2, 2016

RECEIVED
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OFC. OF ENVIRONMENTAL QUALITY CONTROL

Mr. Scott Glenn, Director
Office of Environmental Quality Control
Department of Health, State of Hawai'i
235 S. Beretania Street, Room 702
Honolulu, Hawai'i 96813

Dear Mr. Glenn:

With this letter, the Department of Agriculture hereby transmits the Draft Environmental Assessment and anticipated finding of no significant impact (DEA-AFONSI) for the Infrastructure Improvements to Agricultural Land situated at TMK No. 9-4-012:002, in the Ewa District on the Island of Oahu for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two copies of the DEA-AFONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneously with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact Linda Murai, Department of Agriculture, at (808)973-9473 or via email at Linda.H.Murai@hawaii.gov.

Sincerely,

Phyllis Shimabukuro-Geiser

for Scott E. Enright, Chairperson
Board of Agriculture

Enclosures

C: Waikele Farms, Inc.

Island Fresh

APPLICANT PUBLICATION FORM

Project Name:	Agriculture Infrastructure Development TMK # 9-4-012:002 Kunia, Oahu, Hawaii
Project Short Name:	Agriculture Infrastructure
HRS §343-5 Trigger(s):	Use of State land
Island(s):	Oahu
Judicial District(s):	Ewa
TMK(s):	9-4-012:002
Permit(s)/Approval(s):	Water Allocation from DLNR CWRM
Approving Agency:	Hawaii Department of Agriculture
Contact Name, Email, Telephone, Address	Linda Murai, Property Manager linda.h.murai@hawaii.gov 808 973-974[illegible] Hawaii Department of Agriculture 1428 S. King St. Honolulu HI 96814
Applicant:	Waikele Farms Inc
Contact Name, Email, Telephone, Address	Larry Jefts, ljefts@aloha.net (808) 688-2892 Waikele Farms PO Box 27 K[illegible], HI 96759
Consultant:	North Shore Consultants, LLC
Contact Name, Email, Telephone, Address	David Robichaux, robichaud001@hawaii.rr.com (808) 368-5352, 2091 Round Top Dr Honolulu, HI 96822

Status (select one)	Submittal Requirements
__x__ DEA-AFNSI	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.
____ FEA-FONSI	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
____ FEA-EISPN	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
____ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the approving agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
____ DEIS	Submit 1) a transmittal letter to the OEQC and to the approving agency, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
____ FEIS	Submit 1) a transmittal letter to the OEQC and to the approving agency, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.
____ FEIS Acceptance Determination	The approving agency simultaneously transmits to both the OEQC and the applicant a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
____ FEIS Statutory Acceptance	The approving agency simultaneously transmits to both the OEQC and the applicant a notice that it did not make a timely determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and therefore the applicant's FEIS is deemed accepted as a matter of law.
____ Supplemental EIS Determination	The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.

____ Withdrawal	Identify the specific document(s) to withdraw and explain in the project summary section.
____ Other	Contact the OEQC if your action is not one of the above items.

Project Summary
Provide a description of the proposed action and purpose and need in 200 words or less.

Waikele Farms Inc. has leased 487 acres of agricultural land from the State of Hawaii and intends to place the land in service for production of crops for local consumption. The lessee has determined that the water infrastructure is inadequate and at risk and plans to improve the land by (1) drilling a new source well for agricultural water, (2) Installing up to three reservoirs for water storage, and (3) construction of accessory builings including , but not limited to two tractor sheds and miscellaneous greenhouses to support farming operations. The proposed action will require a Water Allocation permit, Soil Conservation Plan and building permits. Pending receipt of comments the proponent and approving agency anticipate a finding of no significant impact.

Draft Environmental Assessment

Agriculture Infrastructure Development

Parcel # 9-4-012:002

Kunia, Oahu, Hawaii

April 5, 2016

Draft Environmental Assessment

Agriculture Infrastructure Development

Parcel # 9-4-012:002

Kunia, Oahu, Hawaii

Prepared for:

Waikele Farms, Inc.
PO Box 27
Kunia, Hawaii 96759

Approving Agency:

State of Hawaii Department of Agriculture
Scott Enright, Chair
1428 S. King Street
Honolulu, HI 96814

Prepared by:

North Shore Consultants
2333 Kapiolani Blvd Suite 3107
Honolulu, HI 96726

April 5, 2016

PROJECT SUMMARY

This Environmental Assessment (EA) has been prepared in accordance with Chapter 343, Hawai`i Revised Statutes (HRS), to support the development of agricultural infrastructure on State-owned agriculture land on the Island of Oahu, Hawaii. The requirements for HRS 343 compliance are triggered because the project is located on public land. Pending a review by agencies and interested parties, the proponent and Approving Agency anticipates reaching a Finding of No Significant Impacts.

Name:	Agriculture Infrastructure Development
Location:	Kunia, Oahu, Hawaii
Judicial District:	Ewa
Applicant:	Waikele Farms, Inc. PO Box 27 Kunia, Hawaii 96759
Recorded Fee Owner	Hawaii Department of Agriculture 1428 S. King St., Honolulu, HI 96814
Approving Agency:	Hawaii Department of Agriculture 1428 S. King St., Honolulu, HI 96814
Agent:	North Shore Consultants, LLC 2091 Round Top Dr. Honolulu, HI 96822 Attn: David Robichaux (808) 368-5352
Tax Map Key:	TMK (1) 9-4-012:002
Land Area:	487 acres
Existing Use:	Vacant Agriculture land
Proposed Use:	Active Agriculture Land.
Land Use Designations:	State Land Use: Agriculture District Sustainable Communities Plan: Agriculture County Zoning: Ag-1 Restricted Agriculture
Major Approvals:	Well permit: Commission on Water Resources Management
Anticipated Determination:	Finding of No Significant Impact

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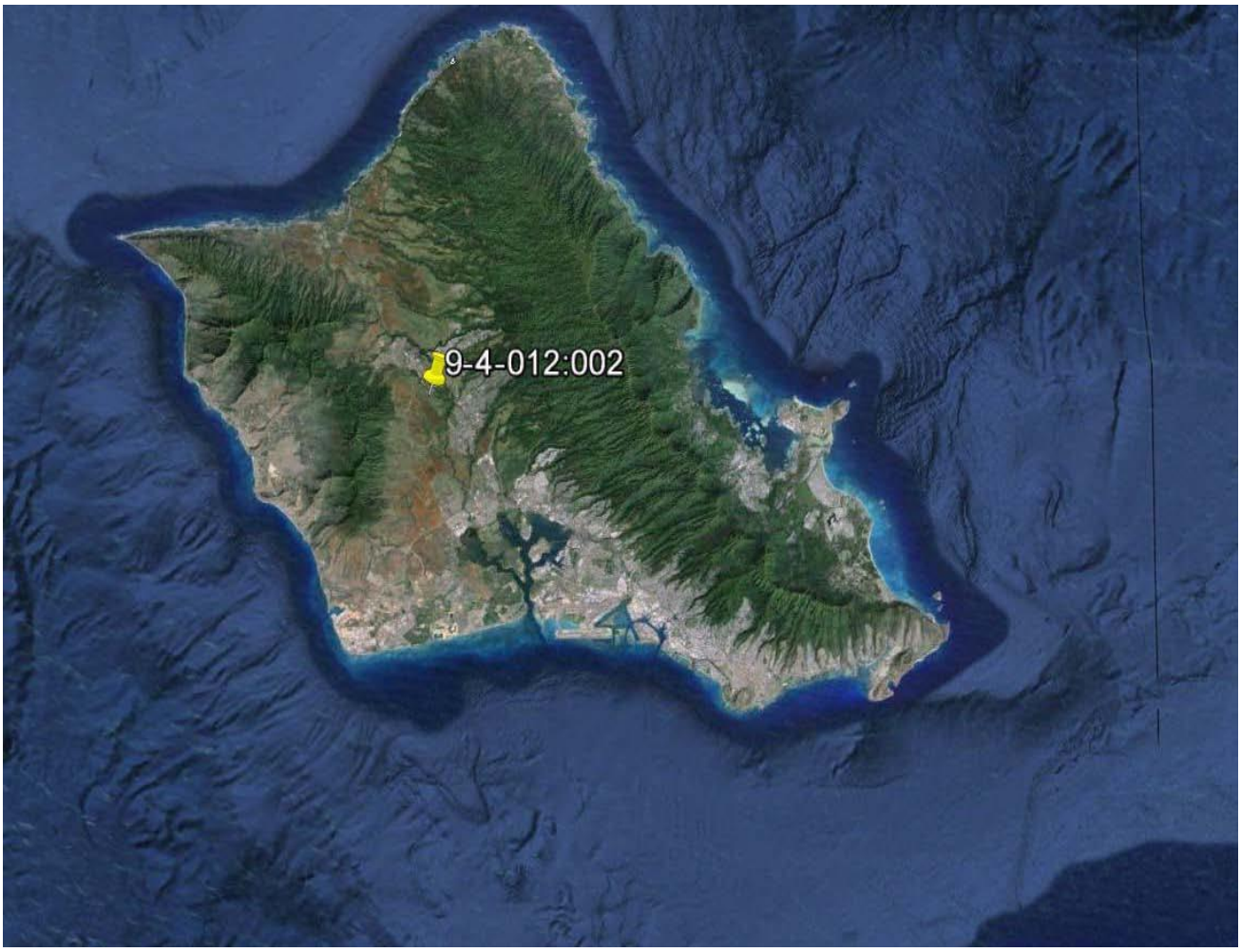
1.0 PROJECT LOCATION

The subject property is located in the Ewa District of Oahu, (Figure 1). The site is adjacent to the south boundary of Wheeler Army Airfield (Wheeler AAF) and west of Waikakalaua Gulch (Figures 1 & 2). Parcel 9-4-012:002 (487 acres), is bounded on the east by Waikakalaua Gulch, on the north by Wheeler AAF. Military Reservation; on the west by Kunia Road, and on the south by agricultural land owned by Island Palms Communities and Robinson Trust. The property is owned by the State of Hawaii, Department of Agriculture and leased to Waikele Farms through a competitive procurement.

Figure 1: Approximate Site location on the Island of Oahu



The center of the parcel is located at Latitude **21° 28.000'(N)** and longitude **158° 2.500 (W).** Access is by existing improved road directly from Kunia Road (Figure 2).

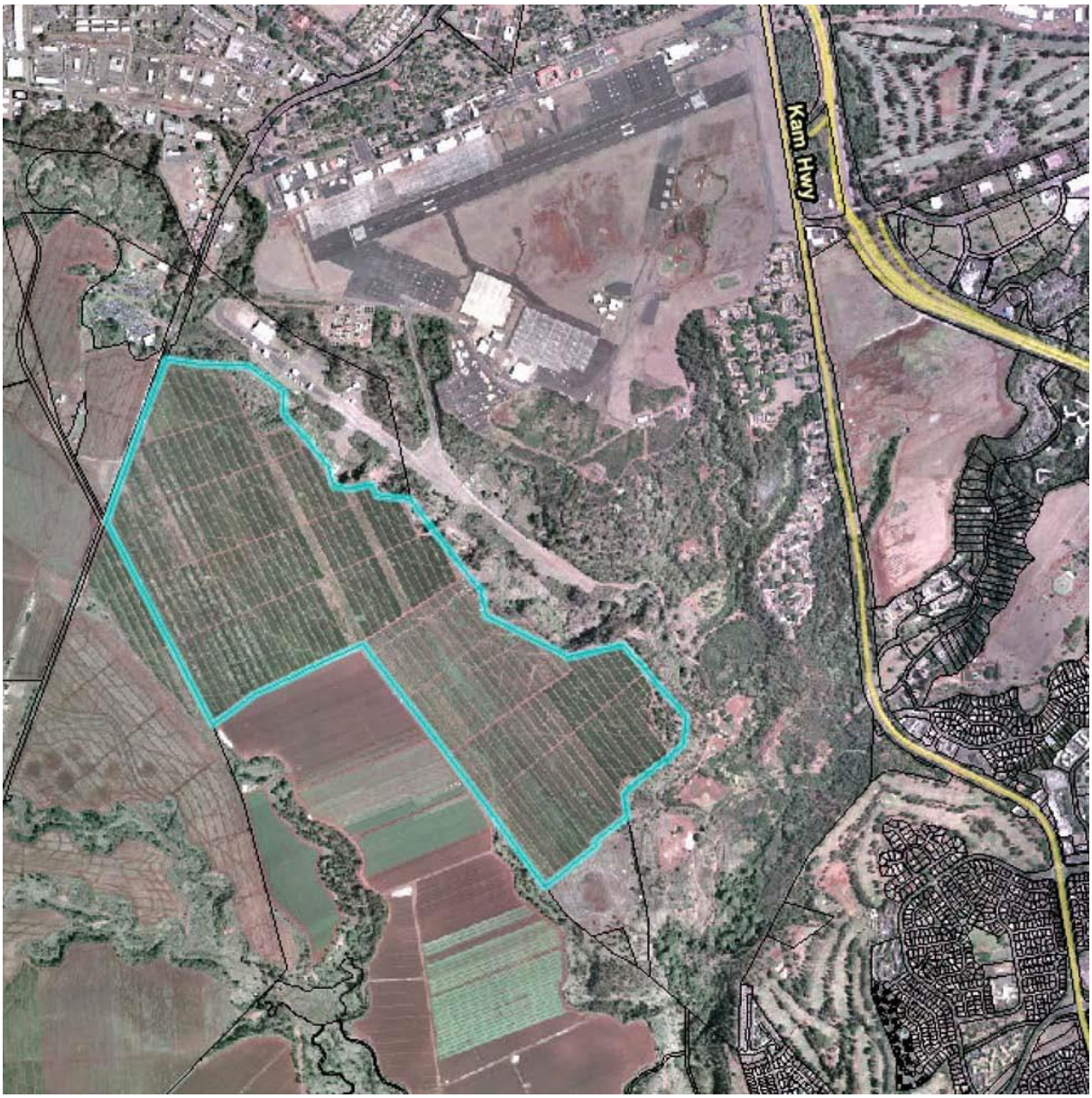


Figure 2: Parcel 9-4-012:002 located immediately south of Wheeler Army Airfield. Access is from Kunia Road via an existing agricultural service road.

The subject property is in a rural setting dominated by large agricultural parcels used for crop production. The one exception is the Military reservation at Schofield Barracks and Wheeler AAF. The entire parcel is zoned Ag-1 (Restricted Agriculture), which is the designation for the most productive agricultural lands. It is also in the State Agricultural District. The land in this vicinity is relatively flat without the gently rolling hills that characterize much of Central Oahu. The area, but not the subject property, is bisected by deeply eroded stream valleys. The closest civilian residential area is Mililani, immediately across Waikakalaua Gulch. The Mililani Golf Course is directly across from the property. Kunia Camp is ½ mile to the southwest and Military housing on Schofield Barracks is 1.3 miles to the northwest.

1.1 NEED FOR HRS 343 ENVIRONMENTAL ASSESSMENT

The Hawaii Environmental Protection Act, HRS 343, requires public disclosure and environmental assessment for any proposed program or project that proposes one or more land uses or administrative acts that are identified in the Statute. The Well and reservoir will be located on State land. This use of public lands necessitates preparation of an Environmental Assessment under the Hawaii Environmental Protection Act, HRS 343.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The parcel is in the State Agriculture District and is zoned Ag-1, restricted agriculture by the City and County of Honolulu. With exception to the military installations to the north and farm-worker housing in Kunia Village, all of the surrounding land is actively used for agriculture.

Figure 3: A large portion of Central Oahu was used for production of pineapple until 2009. This photo shows the area surrounding the subject property in 2003.

Hawaii's economy depends on tourism, government spending and agriculture in that order. As the 2 major agricultural businesses, sugarcane and pineapple, have reduced their contribution to the economy, specialty crops have risen substantially to form a stable economic contribution. This transition from a relatively few large-scale farms based on the commodity crops of sugarcane and pineapple to many smaller scaled specialty agricultural businesses continues to occur. There are approximately 12,000 acres in the Kunia area, significant portions being prime agricultural land suitable for row crops. Within this area there are or will be agricultural opportunities for employment as all the property west of Kunia Road has recently been purchased by agricultural based companies and much of the property on the east side of Kunia Road is currently leased to agricultural operations. The scale up of these operations is continuing. In addition, the Hawaii Department of Agriculture is establishing an agricultural park on 150 acres east of Kunia Road allowing more opportunities for small agricultural businesses. It is anticipated that there will be well over 1,300 agricultural positions available in this area as well as the opportunity for up to 100 new farm sites. The replacement of pineapple crops with vegetables has resulted in a higher demand for water, as has the fragmented ownership of lands under different management and having different water requirements.

The subject property is being leased to Waikele Farms under a competitive procurement from the Hawaii Department of Agriculture. The terms of this lease include the requirement to grow fresh fruits and vegetables for the Hawaii market. This requirement necessitates having a source of clean, water. Many of the proposed products are consumed fresh and cannot be grown on wastewater.

The proposed action is to provide a new water source, renovate the water systems, and build support structures for agriculture to allow fruit and vegetable farming on the subject property. Placing the subject property into active service provides essential support to the goal of returning Hawaii to self-sufficiency with respect to table crops. Without the installation and operation of a well, irrigation reservoirs, and associated accessory uses, farming would be impaired by the lack of agricultural water that is reasonably priced and available at the site.

Figure 4: Melons growing on the subject property June 2015.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 PROJECT DESCRIPTION

The subject property is owned by the State of Hawaii and leased through the Department of Agriculture. It was former Pineapple land until Del Monte withdrew from the Hawaii market in 2009. The land has been fallow since that time. As of the start of 2015 the subject property has been leased to Waikele Farms, Inc. Waikele Farms is one of several operating entities managed by the Jefts Family that supplies the majority of local produce to Hawaii's consumers. They are active on both Oahu and Molokai and have been farming continuously for the past 43 years. The subject parcel covers 487 acres, and is unusual in that the entire parcel is arable. The property will be used to cultivate some combination of cucumbers, tomatoes, bell peppers, melons, cabbage or bananas for the local Hawaii market. The existing irrigation infrastructure available on the parcel is inadequate for vegetable crops and the lessee has determined that it is in the best interest to invest in a well and other water infrastructure to support the proposed operations. The proposed action has several components described below.

Water Source Well:
Principal among the requirements for farming is a reliable source of clean water. Waikele Farms proposes to install an 18" well to a depth of approximately 1000 feet below the existing ground surface. It will penetrate the groundwater lens by about 200 feet. The well will be cased using steel casing to the approximate depth to water and steel well screen for the interval below water. A submersible well pump will be installed in the well and tested for yield and water quality. The surface completion will be above ground and through a series of valves the water will discharge into one of several new or existing agricultural reservoirs (see below).

Construction and operation of the well will be permitted in advance through two permits from the Commission on Water Resources Management (CWRM). The location is within the Waikele-Waipahu Water Management Area. A water allocation will be secured from the Commission on Water Resources Management. The well location will be at Latitude **21º 27'.57 N**, Longitude **158 º 2'.34 W**. This position places it within the Waipahu-Waiawa designated water management area and accessible by a perimeter road. Power lines are located along the gulch immediately south of the proposed location (Figure 5-6).

Upon completion of installation the well system will pump a maximum of 1,217,500 gallons per day as required to meet agronomic needs. The proposed well design is presented in Figure 7. Because of the specific requirements imposed by food quality regulations and wholesalers much of the water used within the farm must be potable and free of pathogens. None of the water is intended for domestic use.

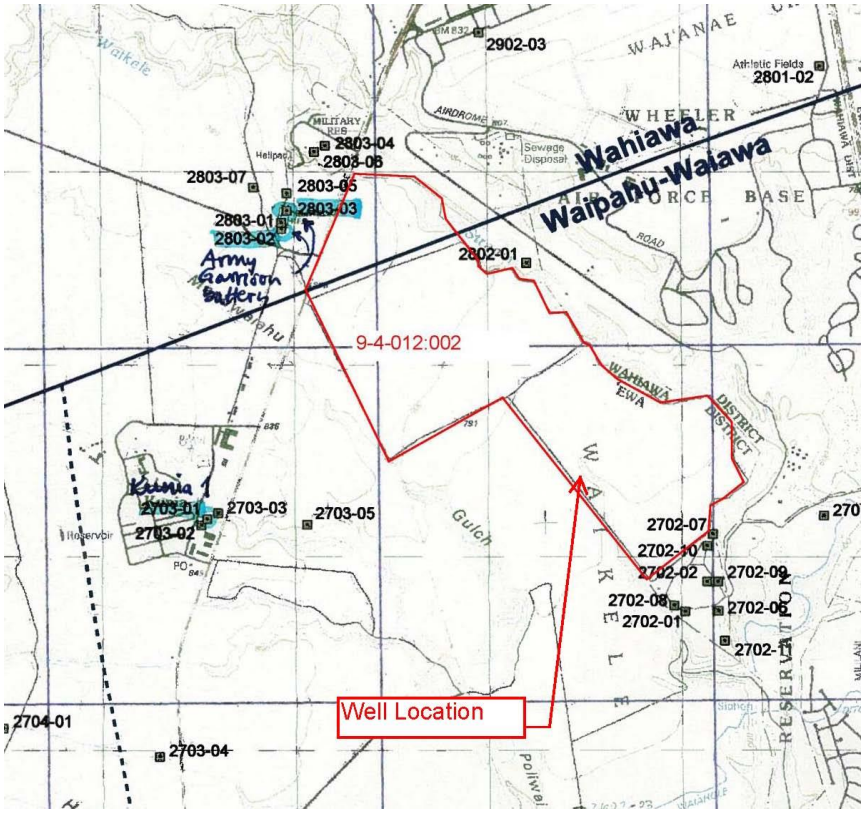


Fig 5: Well Location map showing the approximate location of the proposed water source well at Latitude 21º 27'.57 N, Longitude 158º 2'.34 W; within the Waipahu-Waiawa water management area designated by the Commission on Water Resources Management (CWRM 2015).

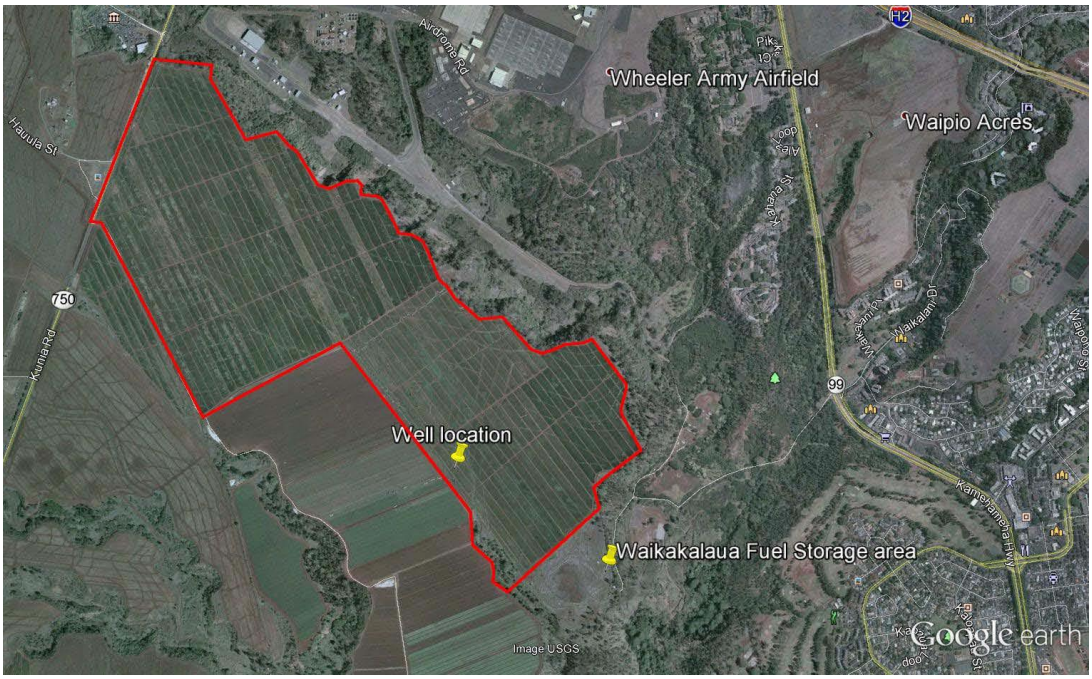


Figure 6: A 2006 Google Earth aerial photo of the project site showing the approximate well location.

TMK: 9-4-012:002

Item	Unit	Description	Quantity
1	LF	24" borehole	970
5	LF	18-inch dia., solid casing conforming to ASTM Grade	800
6	LF	18-inch diam. screen casing conforming to ASTM A-	170
7	LF	gravel pack	370
8	LF	Cement-grouting the annular space, including grout	600

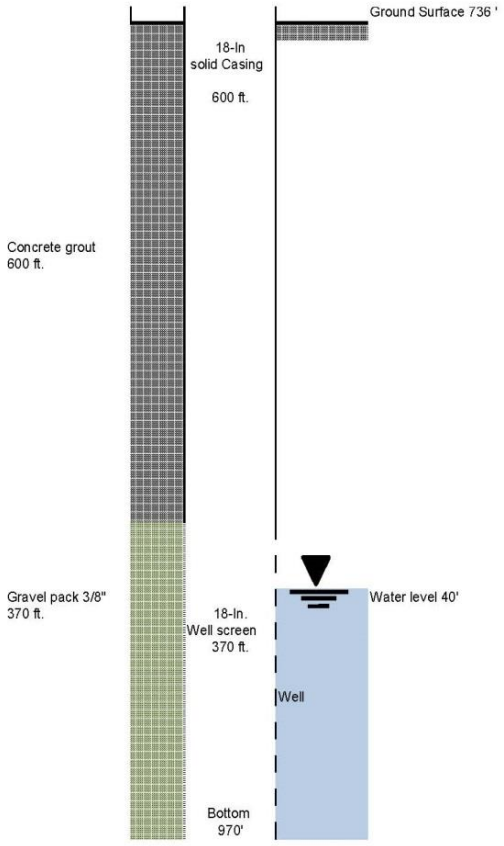


Figure 7: Conceptual design of the proposed well showing components, depth and size of casing.

Agricultural Reservoirs

The proposed action includes construction of up to three new agricultural reservoirs. These reservoirs serve important functions to agricultural production including:

- Allowing water to be collected and stored for later use at the time water is available
- Allowing water to be pumped when power is available or less expensive
- Allowing water from different sources to be mixed
- Making water available during power outages or other emergencies, and
- Allowing for redundancies in the event of need in adjacent areas.

Each reservoir will be similar in design and constructed from on-site soil. Cut and fill will be balanced to produce a rectangular depression surrounded by bermed soil. Reservoirs will be lined with 35 Mil woven liner made of heat-welded polypropylene. A geotextile also of polypropylene will protect the liner and prevent it from sliding on inner slopes. A 2-foot by 2-foot anchor trench will be installed on the berms to hold the liner edges in place. The anchor

trench will be filled with gravel and topped by native soil. The approximate dimensions of all three reservoirs will 436 ft. by 488 ft. The height between the bottom of the reservoir and the top of the berms will be approximately 16 feet, with a maximum water depth of 14 feet. The berm height above the surrounding ground level is estimated to be 9 feet, and the working storage volume of each will be up to 14 million gallons. Table 1 lists design specifications for the three reservoirs. Their approximate location is shown in Figure 8.

Table 1: Design specifications and location of the three reservoirs proposed

Criterion	
Water Depth at Capacity	14 feet
Berm Height Above Ground Level	9 feet
Overall Height	16 feet
Volume at Capacity	14 million Gallons
Length	488 feet
Width	436 feet
Inner surface slope	2:1
Outer surface slope	3:1
Elevation above Mean Sea level	730 – 745 feet above mean sea level
Location 1	21° 27.74', 158° 2.45'
Location 2	21° 27.68', 158° 2.38'
Location 3	21° 27.45', 158° 2.12'

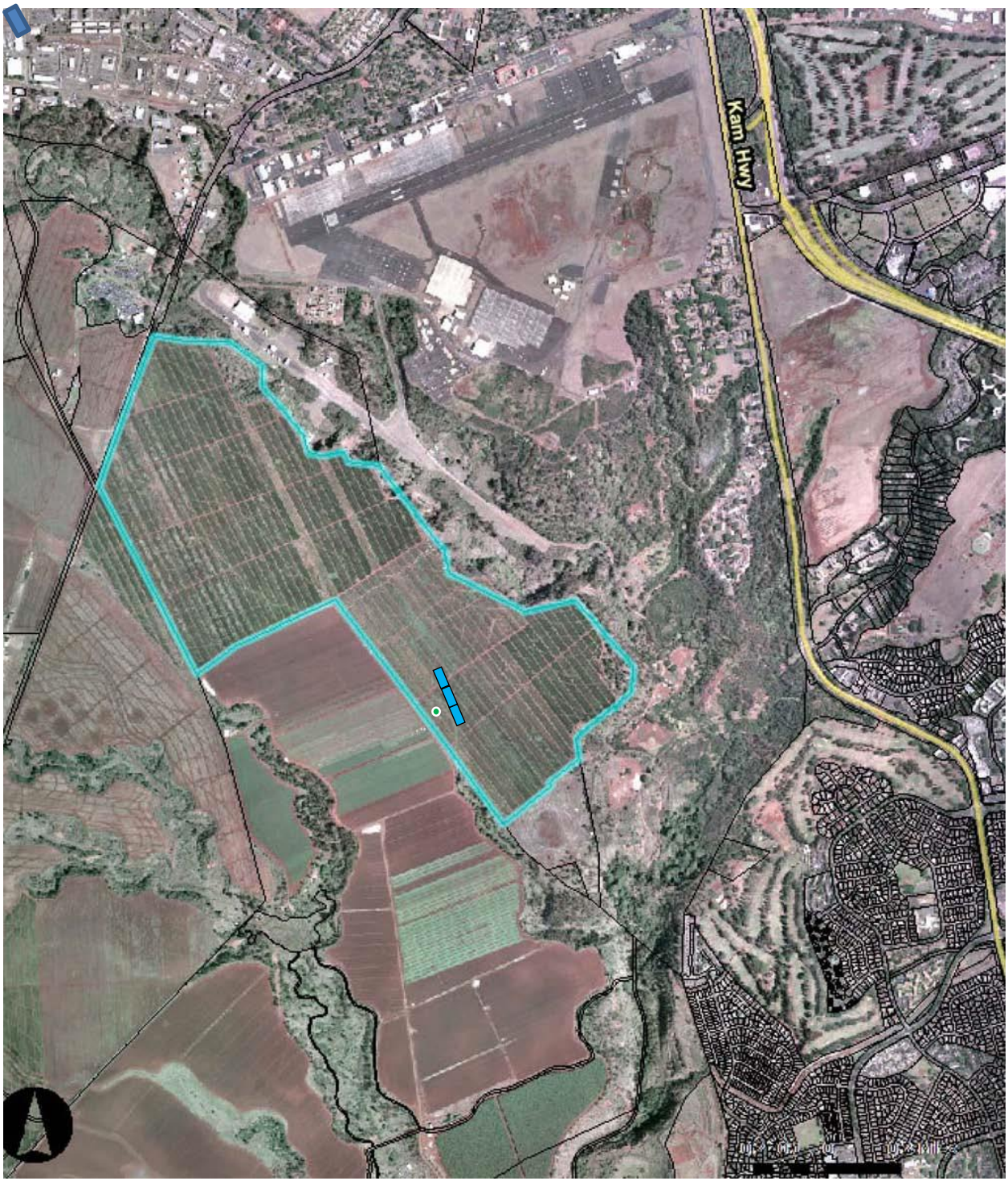


Figure 8: Approximate location of three agricultural reservoirs and water source well to be installed on the subject property.

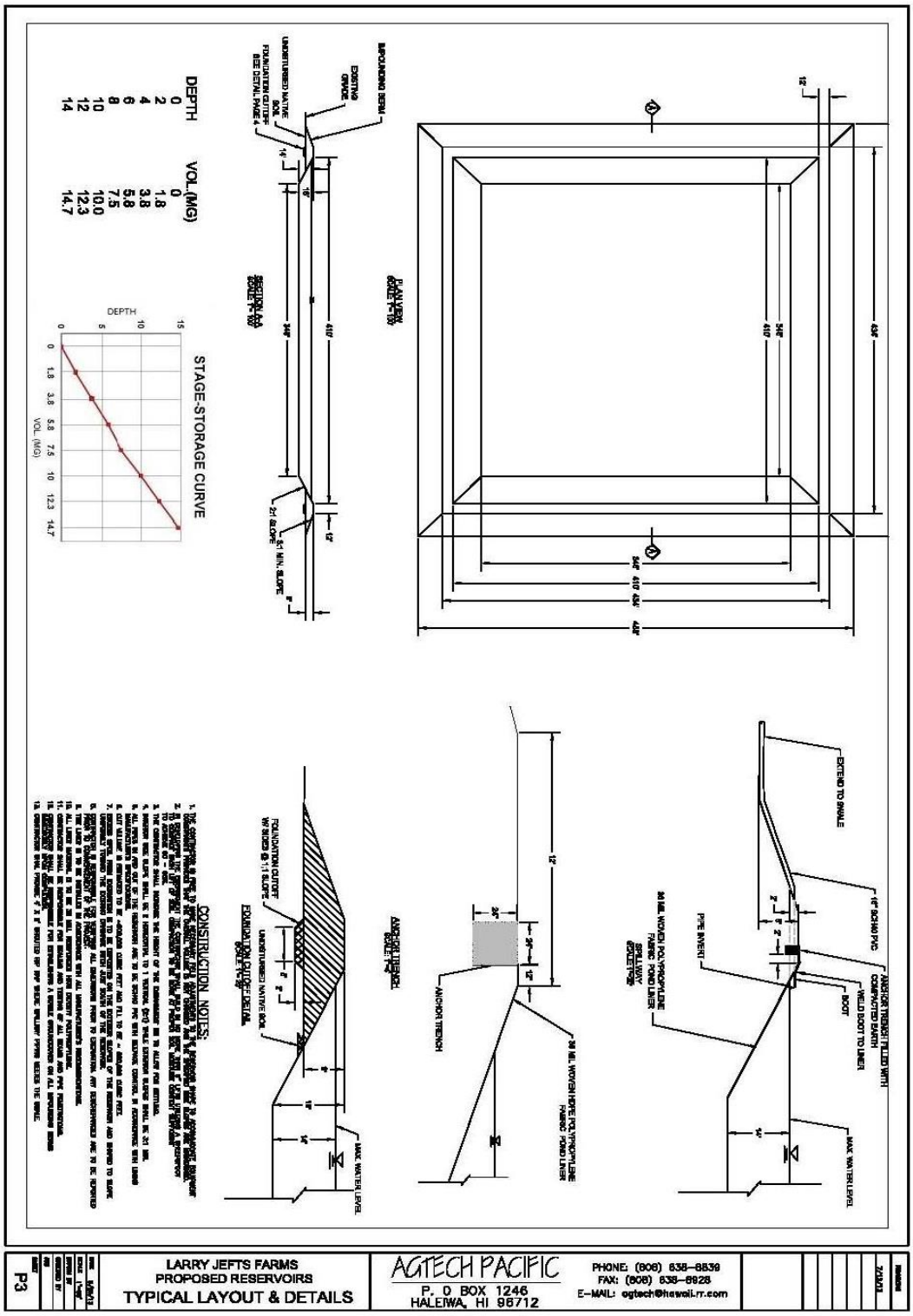


Figure 9: Reservoir design as described above.

Miscellaneous Farm Structures

The subject property will be improved with accessory to agricultural structures required for farm machinery maintenance, nursery production and possible energy production for on-farm use.

Two 60 x 80-foot **tractor sheds** will be constructed for storage and light maintenance of farm machinery. They will be built with steel beams, roof and at least one side wall. Overall height will be less than 25 feet. The building may have a small enclosed tool room. No electrical power will be supplied to the tractor sheds.

Up to 15 acres of **greenhouses** will be submitted for approval to the City and County. Each will be used in nursery production of on-farm plants and associated laboratory work involved for production of seedlings for out-planting or other farm benefit. Photovoltaic panels may be considered for the greenhouse roofs. Solar panels provide partial shade for the nursery plants beneath them and serve the dual purpose of shading and providing power. Greenhouses will be located along the southern or eastern edge of the property.

Water pumping cost is a significant expense for farmers and water providers in Central Oahu because of the elevation of the land above groundwater which is typically up to 800 feet below ground surface. A conceptual layout of these accessory farm structures is shown in Figure 10.

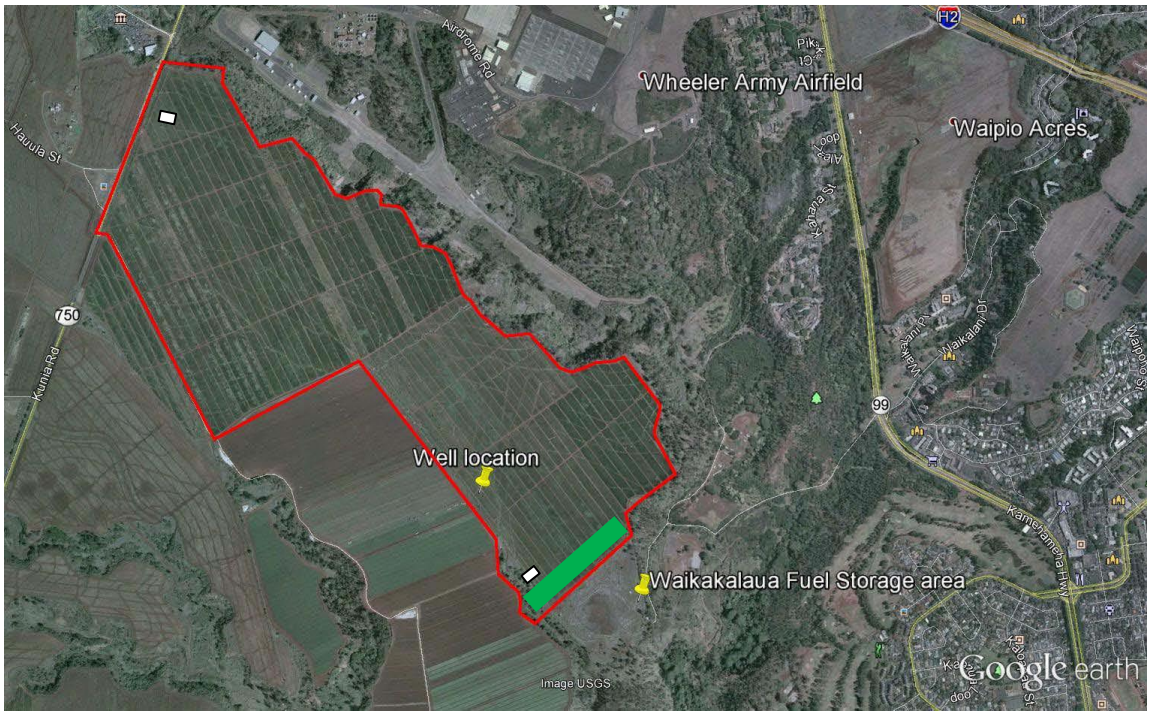


Figure 10: Aerial photograph with approximate locations of accessory uses, including tractor sheds (white) and greenhouses (green). The number and size of greenhouses to be determined.

2.2 ALTERNATIVES TO THE PROPOSED ACTION

Alternative locations are not considered because the lease to this parcel has been executed. Alternative sources of water are considered in the Well permit application (Appendix B), which is required to be approved prior to construction.

Surface Water: The Waiahole Ditch passes within ½ mile of the subject property. It is a 22-mile long system of tunnels, ditches, and inverted siphons that takes high-level ground water from four windward development tunnels and conveys it to the farm areas in central and leeward Oahu. On the windward side of the island in Waikane Valley, two release points were installed to meet the State Water Commission's Decision and Order to restore windward streams. The ditch now has an average daily flow of 28 MGD, although its transmission capacity is 100 mgd. As a result of this order, the status quo of the agricultural use and the availability of Waiahole water during drought or low rainfall periods are severely restricted by the water allocations set by the CWRM (HDOA, 2003). The ditch service area runs from its location to downgradient parcels. The subject property is not within the Waiahole Ditch service area. If a variance to the service area was requested, the addition of over 400 acres of vegetable crops would exceed the capacity of surface water now available to the area during dry periods.

Other Sources of Groundwater. The State of Hawaii is a member of the Kunia Water Association (KWA) by virtue of its ownership of the subject property. KWA depends on two wells to supply the majority of farm users located at elevation higher than the Waiahole Ditch. Its allocation is in the vicinity of 2 million gallons per day, which is almost entirely utilized during dry months. The subject property has some allocation from KWA, but has never utilized it since the conversion out of pineapple. In the meantime, other members have become more productive and are currently over-using their allocation. Irrigation water required for intensive vegetable production can exceed 1 MGD. The addition of this volume would constrain production of other KWA members.

A second reason to have a new source is to provide redundancy to the subject property or to supply adjacent areas in the event of lost pumping capacity as a result of administrative changes or equipment failures. One of the two wells utilized by KWA is leased from the military on a 5-year revocable lease. The army re-evaluates its objectives on a regular basis and could withdraw the well from KWA. A third well that has been used by the Association is the source well contaminated by the 1977 Del Monte Spill. The EPA shut down pumping from this well for a period of 2 years to evaluate leaching into the basal aquifer. The Well which is used most consistently passed its design service life 20 years ago. Due to a breakdown KWA had only one functioning well available for a period of three months during 2014-15. Interruption of water service to the Kunia Water Association or the subject property would result in a significant economic impact to agriculture in Central Oahu.

Utilizing existing sources for agriculture on the subject property carries significant risk of:

- Limiting groundwater availability to KWA members,
- Having no backup if one or more wells is administratively withdrawn from use, and
- Having no backup if one or more of the well breaks down.

Wastewater: Wastewater may become available from the Schofield Barracks Wastewater Treatment Plant located at Wheeler Army Airfield. Approximately 2 MGD is produced by the facility and 1 MGD has been offered for use on the subject property. The offer has been consistently challenged by the Army and Actus Lend Lease who contend that they should have rights to the wastewater since they are the generator. The contract with the operator does not support this conclusion, and it appears that the utilization of wastewater will be tied up in contractual negotiations and/or litigation for years to come.

The wastewater generated at Wheeler AAF has not been certified as R-1 (unrestricted) quality by the Hawaii Department of Health. As such it could not be used on the property to irrigate fresh vegetables and its use would violate the essential terms and conditions of the property lease. Should wastewater become available, and be certified for unrestricted use it may be used to partially offset the pumping volume from the proposed well. The business decision to use wastewater will be thoroughly vetted by Waikele Farms prior to use, because certain buyers have more stringent requirements for food safety, and the use of unrestricted wastewater may impact marketability of produce or its market value.

Selected Alternative

Additional irrigation water from the proposed source wells and reservoir provides assurances that adequate water will be available for farming the subject parcel. It may not be completely utilized and there is some potential that it will be marginally pumped should wastewater become available at an attractive price; however, the value of adequate water for farming the parcel is sufficient for Waikele Farms to expend private funds for its development. The proposed water well and reservoir system is the selected alternative because the other alternatives lack redundancy or may be withdrawn administratively.

3.0 PHYSICAL ENVIRONMENT

The Island of Oahu covers 597 square miles, and is the third-largest island in the Hawaiian chain. The island was formed about 4 million years ago by two volcanoes: Waianae and Koolau. Waianae, the older of the two, created the mountain range on the western side of the island, whereas Koolau shapes the eastern side. Central Oahu is an elevated plateau bordered by the two mountain ranges, with Pearl Harbor to the south. Oahu's most famous natural landmarks, including Diamond Head and Hanauma Bay, are tuff rings and cinder cones formed during a renewed volcanic stage (roughly 1 million years ago).

3.1. GEOLOGY AND SOILS

Oahu was formed by at least two volcanoes approximately 4 million years ago. The upper 5 to 100 feet of the island surface has weathered into a variety of soils, almost all acidic. The upper 100 to 200 feet of soil beneath the site is composed of saprolite clays, which are weathered-in-place basaltic rock. Beneath the saprolites are lava zones which alternate between clinker, rock and cinder.

The subject property is composed mainly of Wahiawa silty clay (WaA) (US Soil Conservation Service, 1972). The Wahiawa series soils support vegetation including crops such as vegetables, grasses, low shrubs. This soil type tends to be quite slippery when wet and dusty when dry.

Soils from the Wahiawa series (WaA) are described as follows:

Wahiawa Series

> *This series consists of well-drained soils on uplands on the island of Oahu. These soils developed in residuum and old alluvium derived from basic igneous rock. They are nearly level to moderately steep. Elevations range from 500 to 1,200 feet. Rainfall amounts to 40 to 60 inches annually; most of it occurs between November and April. The mean annual soil temperature is 71° F. Wahiawa soils are geographically associated with Kunia, Lahaina, Leilehua, and Manana soils. These soils are used for sugarcane, pineapple, pasture, and home sites. The natural vegetation consists of Bermuda grass, guava, honohono, koa haole, and lantana.*

Wahiawa silty clay, 0 to 3 percent slopes (WaA).

> *This soil occurs on smooth, broad interfluves. Included in mapping were small areas of Kunia, Lahaina, and Leilehua soils. In a representative profile the surface layer is very dusky red and dusky red silty clay about 12 inches thick. The subsoil, about 48 inches thick, is dark reddish-brown silty clay that has subangular blocky structure. The underlying material is weathered basic igneous rock. The soil is medium acid in the surface layer and medium acid*

to neutral in the subsoil. Permeability is moderately rapid. Runoff is slow, and the erosion hazard is no more than slight. The available water capacity is about 1.3 inches per foot in the surface layer and about 1.4 inches per foot in the subsoil. In places roots penetrate to a depth of 5 feet or more.

The soil at the subject property appears to support vegetation including grasses, weeds, shrubs and trees. These soil types tend to be quite slippery when wet and dusty when dry.

3.2 SURFACE WATER

The subject property is roughly 7 miles upgradient from the Pacific Ocean at Pearl Harbor, 8 miles from the Waianae Coast, and 9 miles from the North Shore. All open Coastal waters are classified as Class A or AA Open Coastal Marine waters. Storm water is likely to drain into Waikele Gulch, and ultimately into the Middle Loch of Pearl Harbor. Pearl Harbor has a special classification for water quality standards. The nearest surface water body is Lake Wilson (Wahiawa Reservoir) approximately 1 mile to the northeast and upgradient from the subject property.

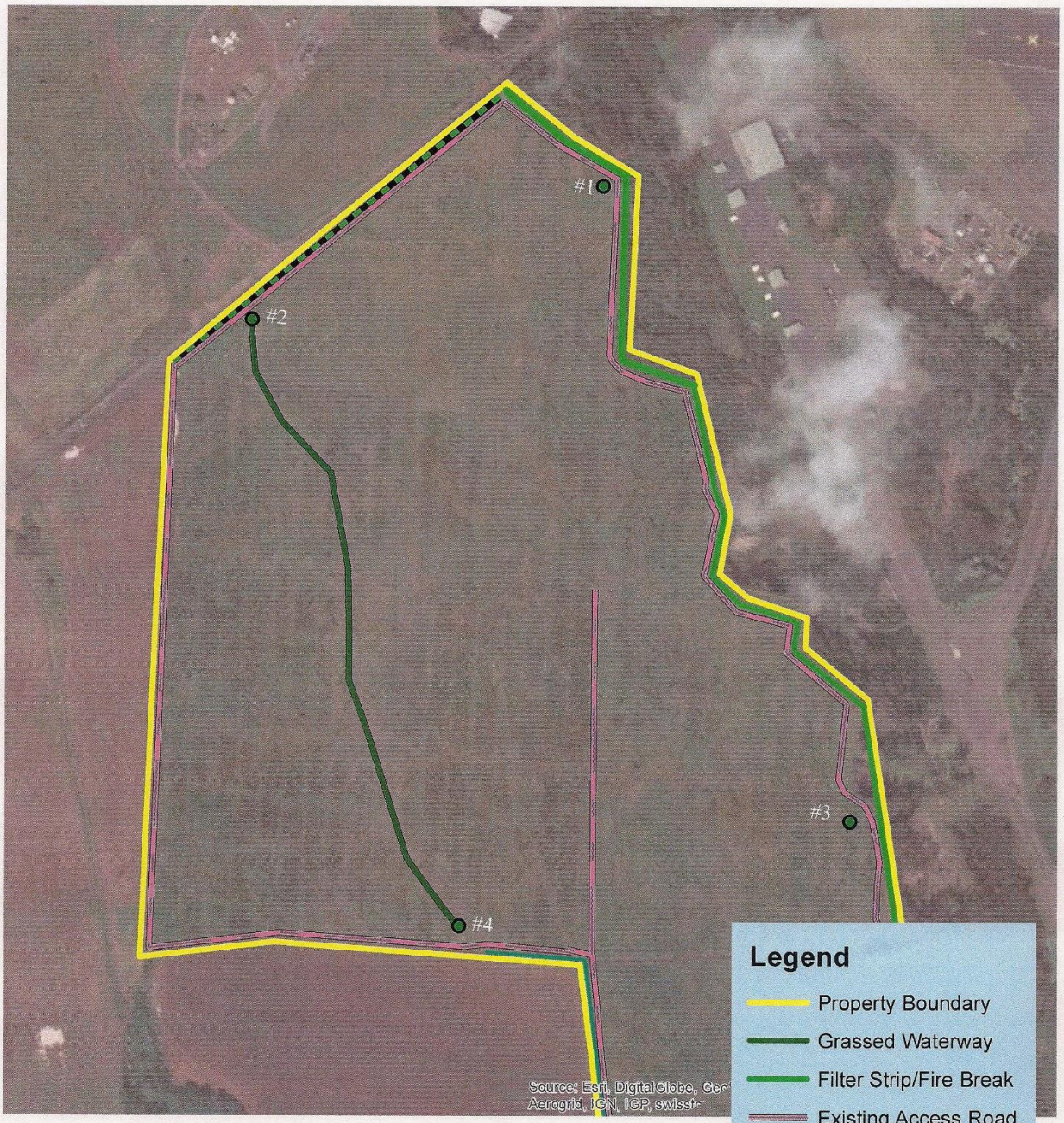
Waikele Stream and Waikele Gulch bound the property on the east side. Waikele stream is perennial with a small but consistent volume during dry months and somewhat expanded flow during the wetter periods. The stream is hydraulically downgradient from the parcel and would receive stormwater runoff and sediment during severe storm events. The subject parcel is located in FEMA flood zone D (not studied); however, the property is outside the 100-year floodplain. It is also outside the Oahu Civil Defense Tsunami inundation zone.

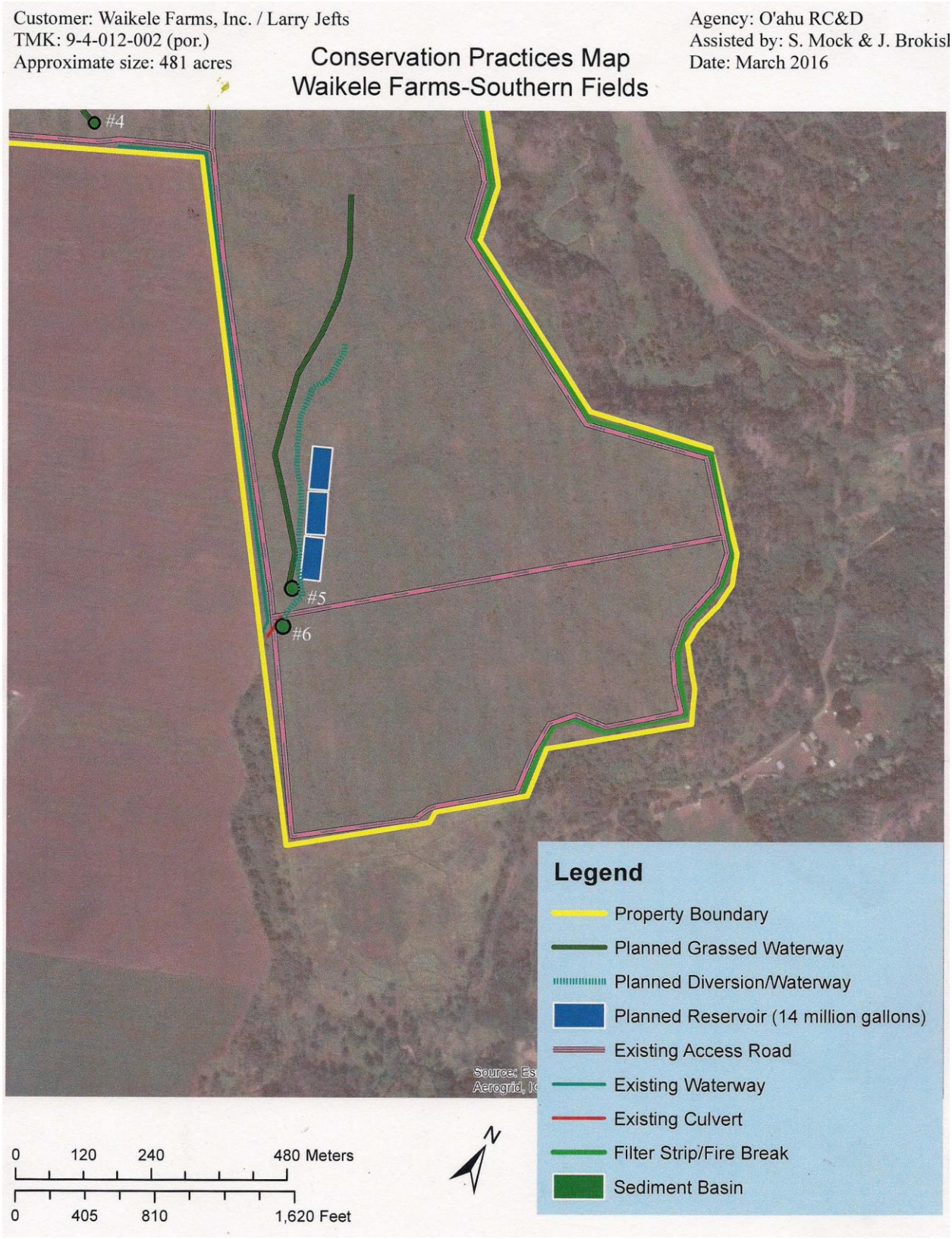
Stormwater runoff and associated impacts will be minimized through preparation of a Soil Conservation Plan. The Soil Conservation Plan calls for sediment basins collecting stormwater from grassed waterways; water diversion channels; perimeter berms in some locations, and filter socks in other locations. The proposed locations for stormwater features are shown in Figures 11 and 12. Best Management Practices will be employed during drilling the well and construction of the reservoir. These will include secondary containment for fuels, lubricants and solvents that are brought to the site during construction. Silt fences will be designed and maintained as necessary for soil erosion control, and when feasible construction will be done during the expected dry months.

Customer: Waikele Farms, Inc. / Larry Jefts
TMK: 9-4-012-002 (por.)
Approximate size: ~481 acres

Conservation Practices Map
Waikele Farms-Northern Fields

Agency: O'ahu RC&D
Assisted by: S. Mock & J. Brokish
Date: March 2016





Figures 11 and 12: Soil Conservation Plan features to minimize stormwater runoff and soil loss.

3.3 CLIMATE AND AIR QUALITY

The project site has a mild, semi-tropical climate characteristic of most regions of Oahu. The average maximum daily temperature ranges from 78 °F to 87 °F, with an average minimum temperature ranging from 60 °F to 68 °F depending on the season (Atlas of Hawaii 1992). Rainfall for this area averages 45 inches annually, with much of it occurring between November and April. Winds from the northeast, known as trade winds, are the most predominant over the Hawaiian Islands. Typical wind velocities range from 3 to 14 knots. There is an occasional shift in the wind patterns to the westerly "Kona" winds which are sometimes quite strong. In Hawaii, both federal and state environmental health standards pertaining to outdoor air quality are generally met due to prevalent trade winds. Aircraft operations at Wheeler Army Airfield are likely the largest source of stationary air emissions in the vicinity, yet due to the consistent winds, the regulated air pollutants in the area are within the air quality limits established by the Clean Air Act. Air emissions sources associated with construction of the well and reservoir include diesel engines on mobile equipment including the drill rig, support vehicles and heavy construction equipment needed to excavate the reservoir area and install a liner. The anticipated level of emissions associated with construction do not require a permit under the Clean Air Act or Hawaii Standards due to the temporary nature and limits of anticipated emission. During construction there may be additional traffic with temporary contributions to air pollution from fugitive dust and automobile emissions. Automobile and fuel power construction equipment will be limited to that necessary to build the project, and fugitive dust will be managed under best management practices as defined by the State of Hawaii.

3.4 NOISE AND ODOR

The subject property is relatively quiet, and isolated from residential areas by more than 1 mile at the nearest. Ambient noise levels are significantly affected by helicopter traffic into Wheeler Army Airfield, which is the largest source of ambient noise in the area. Flight operations persist day and night.

Noise associated with the proposed action will include construction noise during business hours. This construction noise is expected to be intermittent, temporary, and confined to business hours during construction periods. Operational noise will be restricted to periodic operations of mobile and stationary farm equipment

3.5 SCENIC VALUE AND VIEW PLANE

The topography of the subject property is unusually flat in comparison to the low rolling hills in the immediate area. There is little perceptible slope, with the majority of the property between 780 and 820 feet above mean sea level (msl). There is a gentle slope toward the east in the vicinity of Waikele Gulch. The parcel boundary with Waikele gulch drops off precipitously. View planes exist from traffic traveling north on Kunia Road looking east across the parcel to the historic hangers on Wheeler Field. Much of the remainder of the views are of farm lands that

stretch in all directions. The Waianae Range bounds the views to the west and the Koolau Range is seen to the east. The small farm plats recently established on the west side of Kunia Road are particularly scenic due to the windbreaks and row crops that are seen on the hillsides. Views toward the southwest include Kunia Village which contains farm worker housing and agricultural warehouses.

The proposed action is to add water infrastructure to agricultural land that are not expected to create noticeable changes in the view planes or scenic vistas from within or around public areas. Upon completion the well will be poorly visible from Kunia Road due to its distance. The reservoirs will appear very similar or identical to the roadside berms that are now present along Kunia Road. The tractor shed will be occluded from view by the roadside berms and reservoirs. Greenhouses will not be visible from Kunia Road or other public areas because of the local topography and its distance from public roads.

3.6 HAZARDOUS SUBSTANCES

Construction equipment using fossil fuels and hydraulic power will be used in grading and building the facility. There is some possibility of leaks, spills or accidents during construction. All construction equipment operators will be required to develop and maintain an emergency action plan for management and recovery of any release to the environment. Drilling contractors are accustomed to working on wells that produce potable water. There are no hazardous materials used in the construction or operation of the water source equipment. Reservoir liners are primarily heat welded. Solvent cement may be used to patch tears or penetrations in the liner. Solvent cement is used in small quantities and remains volatile for only short periods. With adequate management the potential impacts from hazardous materials can be completely mitigated. Petroleum products and solvents are likely to be used and stored in the tractor shed. Waikele Farms conducts regular safety training which includes the handling and storage of solvents, pesticides and other potentially hazardous materials.

4.0 HYDROLOGIC ENVIRONMENT

4.1 AQUIFER IDENTIFICATION

The Island of Oahu contains 6 aquifers that differ in their geology, hydrology and location. These aquifers are further divided into sectors for administration and management purposes. The initial identification of aquifers was published by John Mink and Steven Lau in 1990, and designated as shown in Figure 11 below. Since that time the groundwater management areas of Waipahu and Waiawa have been combined. Information obtained from The State of Hawaii Commission on Water Resources Management (CWRM) indicates that approximately 20% of the subject property parcel is within the Wahiawa Aquifer Section of the Central Aquifer, and the remaining 80% is within the Waipahu-Waiawa section of the Pearl Harbor aquifer (see Figure 5). The well will be placed above the Waipahu-Waiawa section, having State Groundwater designation #30203.

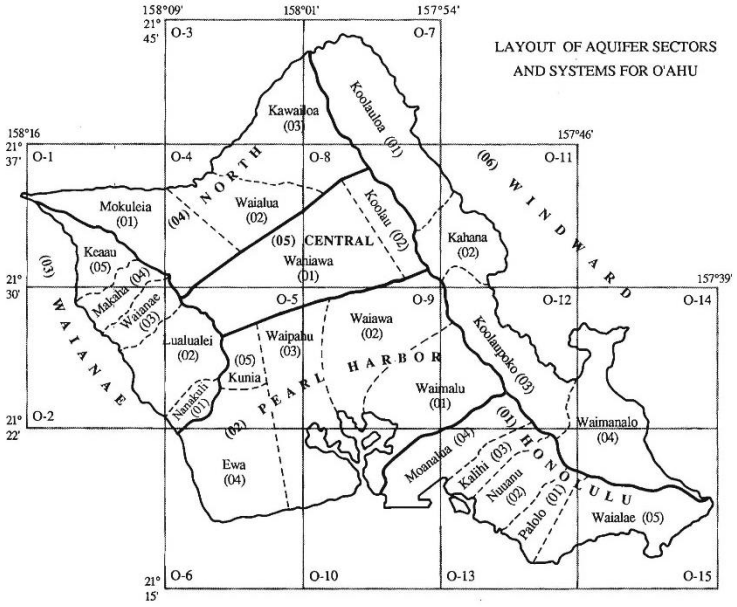


Figure 13: Oahu aquifers and groundwater management areas from Mink and Lau 1990

Mink and Lau (1990) assigned codes to the location, geology hydrology, use, status and vulnerability of the subsurface groundwater resources. The Waipahu and Waiawa sectors are separated by Mink and Lau

Table 2: The Waiawa/Waipahu Water Management Area is categorized as follows

Location	**Code**	**Description**
Island	*3*	*Oahu*
Aquifer	*02*	*Pearl Harbor*
Sector	*02 and 03*	*Waiawa and Waipahu*
Hydrology	*1*	*basal*
Geology	*1,1*	*Unconfined and flank*
Development Stage	*1*	*Currently used*
Utility	*1*	*Drinking water*
Status	***Code***	***Description***
Salinity	*1*	*Fresh (<250 ppm salinity)*
Uniqueness	*1*	*irreplaceable*
Vulnerability to contamination	*1*	*High*

The well location is located in Mink and Lau's Waiawa sector. The Waiawa groundwater management area was used as drinking water source, irreplaceable and highly vulnerable to contamination. At that time the Waipahu sector was classified as potential to use as a drinking water source, irreplaceable, and only moderately vulnerable to contamination. With events over the past few decades we now know that is highly susceptible to contamination.

4.2 CURRENT USE AND STATUS OF THE AQUIFER

The Waipahu-Waiawa aquifer system groundwater management area has a sustainable yield of 104 Million gallons per day (MGD), of which 84.85 MGD is currently allocated among 142 well permits. 19.144 MGD of potential groundwater remains before the sustainable yield is allocated. A well permit application is in preparation that will request an allocation of 1.5 Million gallons per day. Should that permit application be accepted the Waipahu-Waiawa groundwater management area would still retain 17.644 MGD of sustainable yield. The proposed action will not deprive other users of groundwater in the Waipahu-Waiawa groundwater management area.

4.3 CONTAMINATION AND VULNERABILITY ANALYSIS

The quality of native groundwater is the result of the environments through which infiltration water passes and in which water moves and accumulates. Among the obvious contributors to the chemistry of groundwater in an aquifer are the quality of the original water that recharges into the ground, the chemical properties of soils and rocks through which the water passes, residence time of the water in the saturated zone, and quality of waters with which the new water mixes. Seawater intrusion also adds salts to all basal groundwater in Hawai'i. Activities, such as irrigated agriculture and wastewater injection, may significantly alter groundwater quality. Moderate increases in concentrations of nitrate, chloride, sulfate, and silica are attributable to prolonged irrigation of sugarcane. Introduction of organic chemicals including pesticides, herbicides and nematicides have historically accompanied large-scale agricultural use of the land. Infiltration of irrigation and rainwater can result in some degree of contamination to groundwater reserves.

At least three accidental releases of pesticides, fuel, and organic solvents have impacted groundwater in this vicinity. These have had a far greater impact on groundwater quality than the general use of pesticides or other potential contaminants. These releases illustrate the importance of secondary containment and safety controls applied to industrial uses of potentially hazardous materials when the site is located above a valuable and irreplaceable groundwater aquifer.

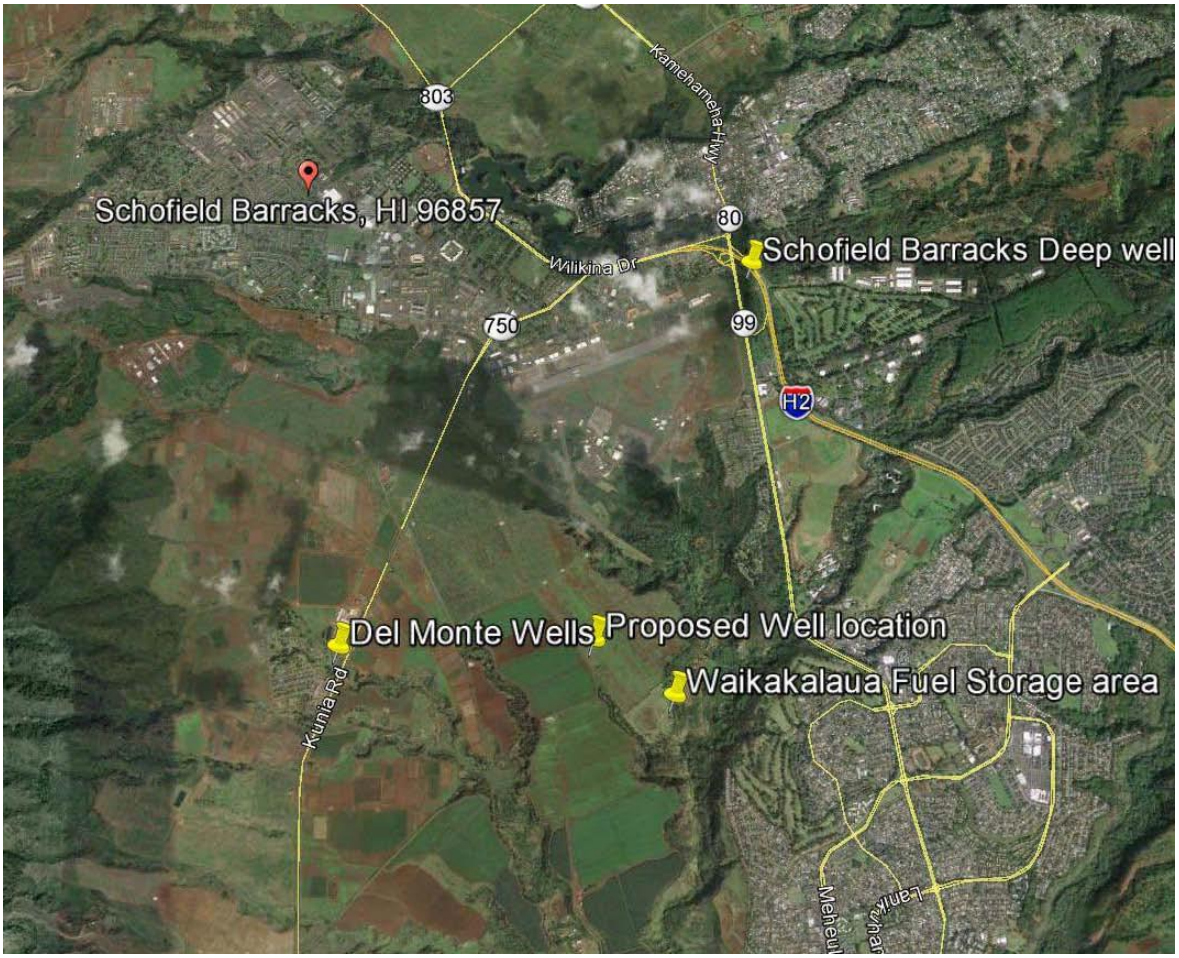


Figure 14: Location of known releases in the vicinity of the proposed new source well.

Del Monte Kunia Wells: Contamination of the Waipahu section was first identified in the early 1980s as a result of a vehicular accident at the Del Monte Hawaii Plantation. Fumigants, such as ethylene dibromide (EDB), 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dichloropropane (DCP) were used from the early 1940s until 1983 to control nematodes that infest the pineapple root. On April 7, 1977, there was an accidental spill of approximately 495 gallons of ethylene dibromide (EDB) within approximately 60 feet of the Del Monte Well in Kunia Village, which provided drinking water to about 700 people within Kunia Village. The well was tested one week after the spill and no contamination was detected. It took several years for the pesticide to migrate to groundwater.

In 1980, the Hawaii Department of Health (HDOH) initiated an investigation to determine whether the fumigants used in pineapple agriculture had contaminated drinking water wells on Oahu. As part of the investigation, the Del Monte Kunia well was sampled. The results indicated the presence of EDB and 1,2-dibromo-3- chloropropane (DBCP). The HDOH ordered the well removed from service. After an investigation required by the US EPA the site was placed on the National Priorities List, which is commonly known as the superfund site list. As of 2015, an 11-

acre portion of the Kunia Village continues to be remediated by Del Monte Corporation under a consent decree with the United States. The source area is 1.25 miles to the southwest, across and slightly down-gradient from the proposed well location. Remedial actions begun in the mid-1980s have been suspended for a period of two years to assess whether the pesticides are still leaching into the basal aquifer. Water testing at this time indicates that the contaminant levels are statistically indistinguishable from background levels (Golder and Associates, personal Communication, 2015). A contaminant plume would be expected to migrate to the south toward Pearl Harbor from the source area, and is not likely to influence groundwater beneath the proposed new well site.

Schofield Barracks Deep Well: In 1985, the Hawaii Department of Health informed the Army that high levels of volatile organic compounds (VOCs) including Trichloroethylene or TCE contaminated wells that supply drinking water to 25,000 people at Schofield Barracks and surrounding areas. After an initial investigation the US EPA placed Schofield Barracks on the National Priorities List, making it Hawaii's next Superfund Site. An extensive investigation was conducted to determine the source or sources of solvents in the groundwater, but that investigation was inconclusive. In the following year, the Army began removing the contaminants from the water by installing an air stripping facility. Since 1985 many thousands of gallons of organic solvents have been removed from the Schofield High level water body; yet wells within three miles of Schofield Barracks in both the Central aquifer and the Waipahu-Waiawa section of the Pearl Harbor aquifer contain contamination and require aeration treatment to remove volatile organic solvents. With aeration the groundwater in these wells meet potable water standards. The Del Monte Kunia Well does not contain TCE, but those approximately 1 mile to the North used by the Kunia Water Association do have measurable quantities of TCE and Trichloropropane (TCP).

Waikakalaua Fuel Storage Annex: The Waikakalaua Fuel Storage Annex (WFSA) consisted of three large fuel storage tanks and several smaller ones that were built to supply Pearl Harbor with gasoline and aviation fuel. WFSA is located approximately 2000 feet to the southeast of the proposed well site. Records indicate that over the 50-year period of service 18 billion gallons of fuel were pumped into the facility and only 14 billion were withdrawn. In the 1990s the Air Force identified 24 points of known or suspected leakage from the system. Bioventing has been employed to remediate fuel in groundwater near the site.

Summary: Pineapple nematocides are found in many of the groundwater management units as a result of previous agricultural practices. Ethyl-Dibromide (EDB) and Di-benzo- chloropropane (DBCP) are the major contaminants of concern. Low levels of these contaminants are now considered "background" and are expected to be found in the proposed well. These may have originated from normal and legal application before these pesticides were banned from use in the United States. The spill near the Del Monte Kunia Wells have probably not migrated that far

across gradient to impact the proposed new source well. The contaminant levels are expected to be below the levels that would restrict its use for agricultural practices of drip, furrow or spray irrigation.

Organic solvents from the Schofield high level water body may overflow into the Waipahu-Waiawa groundwater management unit of the Pearl Harbor aquifer, but these are also not expected to be found in concentrations that require remedial actions.

WFSA is the closest known release to the proposed well site and has influenced its location. A plume of petroleum that is presumed to migrate south toward Pearl Harbor, while the new well site is 0.4 miles west and slightly up gradient from the storage tanks. Fuels from WFSA are also not expected to impact the well location.

Pumping groundwater with exposure to the atmosphere allows volatile chemicals to evaporate to the atmosphere and has been used as a remedial method. The use of basal groundwater will further reduce the levels of these contaminants in the remaining aquifer, and therefore a positive impact on groundwater resources.

4.4 HYDROLOGIC IMPACT ASSESSMENT

The proposed action will withdraw water from the Waipahu-Waiawa section of the Pearl Harbor Aquifer. The location was chosen because current pumping from this section is less than the sustainable yield calculated for the groundwater management area. Based on this assessment, the proposed action will not impact the sustainability of groundwater resources for surrounding properties in the area or the remainder of Oahu.

4.5 WATERSHED AND LAND-USE ASSESSMENT

Most sources agree that the Pearl Harbor aquifer is being pumped at a rate close to that of its sustainable yield, which is 165 million gallons per day, (CWRM, 2015). As the population increases, there will be a higher demand for fresh water; a demand that in the future might not be met. Because of the high population of Oahu freshwater resources are very important to residents on this island. Rainfall is Oahu's primary water resource for streams and groundwater recharge. Natural recharge rates within the Pearl Harbor basin vary from 4,000 mm yr. (157.4 inches) along the upper slopes of the Koolau mountain range to less than 100 mm yr. (3.9 inches) along the leeward coast (Hunt, 1996). Basal groundwater in the area originates as rainwater falling in higher drainage basins to the north and northeast and percolating vertically downward to the basal aquifer within the basalt bedrock. Fresh water of the basal aquifer floats on and displaces the salt water, which saturates the highly permeable basalts at the base of the island Oahu. The impermeable caprock at the coast blocks the flow of freshwater and causes the water to bulge into the shape of a lens. Beneath this freshwater lens is the transition zone where the freshwater mixes with the salty ocean water. Discharge is primarily to wells and shafts and to springs in the Pearl Harbor area. Some ground water also flows out of the southern Oahu ground-water area to the

adjacent southeastern Oahu ground-water area to the east. Unconsolidated and consolidated sedimentary deposits form a thick confining unit near the coast. Coralline limestone within the sedimentary deposits at shallow depths is extremely permeable but commonly contains brackish water. The confining unit locally is more than 1,000 feet thick near the coast. (Oki, et. al. 2005). In some coastal areas, caprock overlies and confines the aquifers, impeding freshwater discharge and impounding basal water to a thickness of as much as1700 feet (Taskin, 1999).

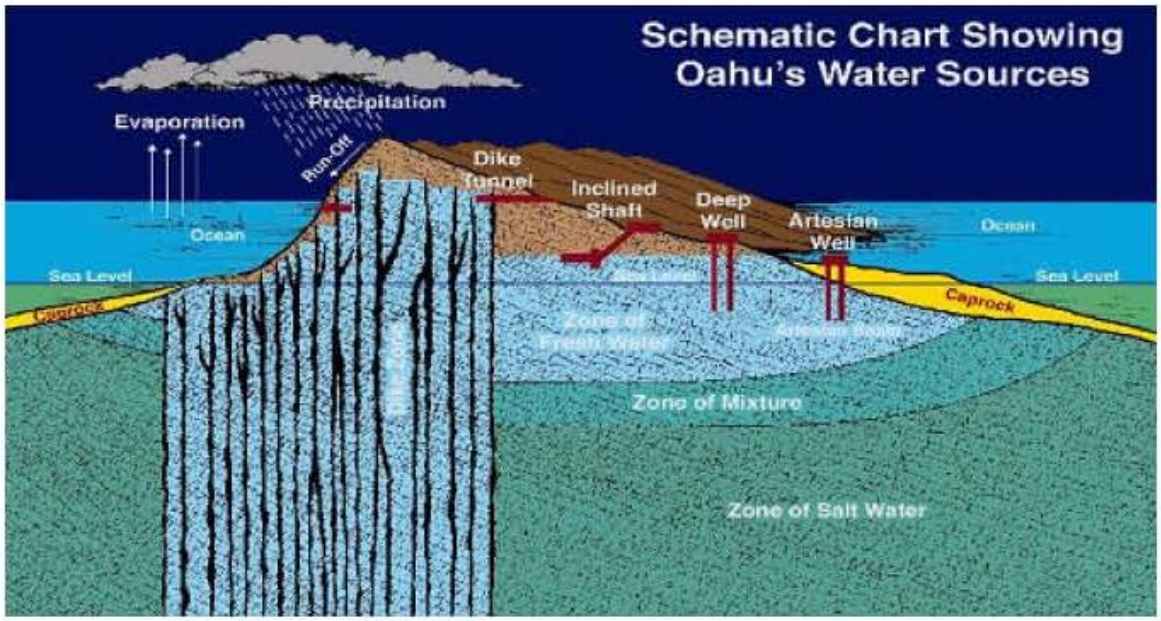


Figure 15. Hydrology of an Island Aquifer (Board of Water Supply 2015)

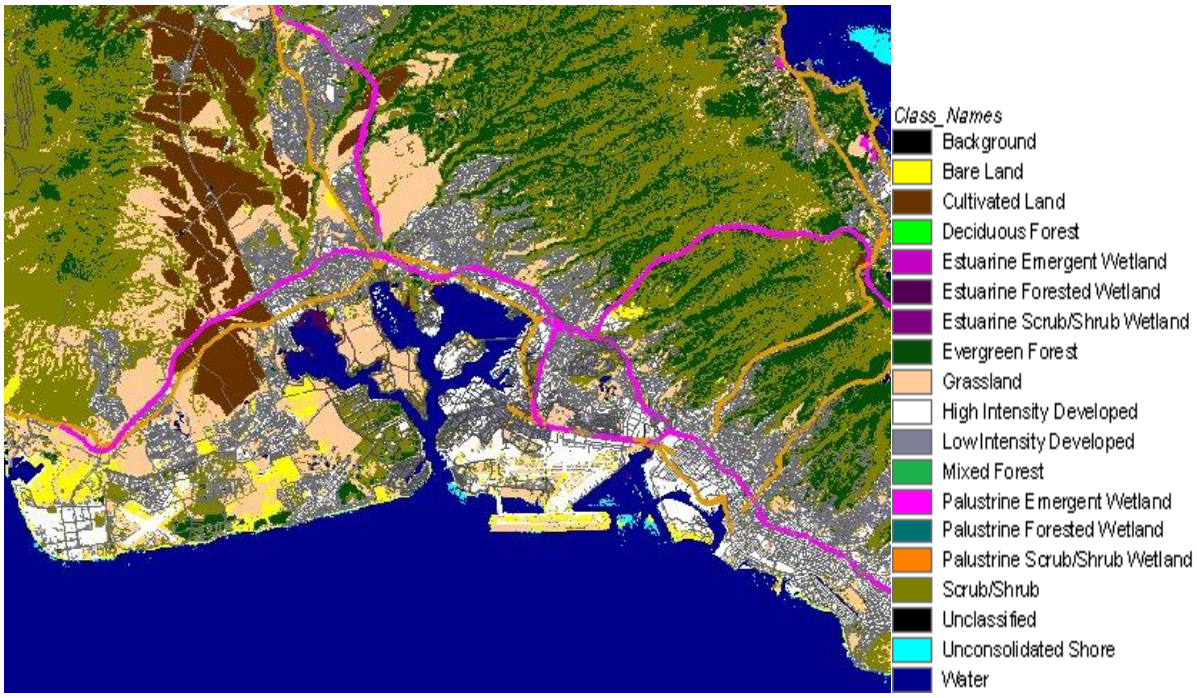


Figure 16. Land Use Map of the Pearl Harbor Area

A large percentage of Oahu's population depends on the Pearl Harbor aquifer for their fresh water resources, which is one reason why it is the most productive aquifer in the state. The Waipahu-Waiawa sector has allocations of 85 million gallons of potable water per day (WRRC, 2015). Most of the surface above the Pearl Harbor Aquifer is developed as either residential or urban areas. Therefore, most of the water pumped from the aquifer is for domestic and commercial use with agricultural representing only about 2% of the total water use. (Pitafi, et. al. 2006). One implication of increasing population is the decrease of agricultural lands. Irrigation of active agricultural land returns more than half of the water volume to the basalt aquifer by infiltrating through the highly permeable soils (Mink, 1962). The map areas shown in brown on Figure 14 represent the largest remaining block of prime agricultural lands on Oahu. They are heavily utilized for production of food crops for local consumption and seed crops for export. Allocation of water to agricultural use has been among the highest priority for State and County leaders (See Chapter 6).

The proposed well installation and allocation of water to support agriculture is both essential and commensurate with controlling plans and policies of the State and will have positive impacts on local food production as well as aquifer recharge.

5.0 BIOLOGICAL ENVIRONMENT

5.1 VEGETATION

The subject property is slightly over 487 acres, irregularly shaped and relatively flat. Its western boundary is along Kunia Road and eastern boundary along Waikele Gulch. The property is undeveloped with exception of formerly used irrigation infrastructure that is mostly underground. The parcel was actively cultivated for pineapple for over 90 years ending in 2009. At the end of 2009 the pineapple crop was tilled under, and the commonly seen early colonizing species became established over the entire area of the subject property. Initially the area was dominated by guinea grass *(Megathyrsus maximus*) and residual pineapple. As time passed Koa haole (*Leucaena leucocephala),* African Tulip *(Spathodea campanulata)* ironwood *(Casuarina sp*.) and kiawe (*Prosopis pallida)* are interspersed with guinea grass and other low shrubs. The vast majority of vegetation on the subject property is introduced to Hawaii and considered invasive.

5.2 WILDLIFE

The subject property has been actively cultivated for over 90 years, as is most of the surrounding area. Natural vegetation and habitat for birds and animals is found in Waikele Gulch to the east and slightly over a mile to the west at the foot of the Waianae Range. The conservation lands on the eastern slope of the Waianae Range may be relatively important habitat for endemic Hawaiian birds including the Oahu elepaio (*Chasiempis sandwichensis ibidis*), Apapane, (*Himatione sanguinea*) and Amakihi (*Hemignathus virens*). Other species common to the area include northern cardinal (*Cardinalis cardinalis*), spotted dove (*Streptopelia chinensis*), red-vented bulbul (*Pycnonotus cafer*), Indian myna (*Acridotheres tristis*) and gray francolin (*Francolinus pondicerianus*). Feral birds include chickens (*Gallus domesticus*) and pheasant (*Phasianus colchicus)*. Feral mammals include pigs (*Sus scrofa*), Indian mongoose (Herpestes javanicus), rats (*Rattus or Rattus norvegicus*) and common mice (*mus musculus*) and cats (*Felis domesticus*).

5.3 SPECIAL-STATUS SPECIES

Past reports have indicated that the general area may contain two varieties rare plants, the Ewa Plains Akoko and Red Ilima. The known locations of these plants are away from the subject property. A letter to the US Fish and Wildlife Service in October 2013 did not identify any special-status species or critical habitats located on the subject property. As referenced above the Waianae Range conservation land contains a relatively important habitat for endemic species of insect, and plants. These are separated from the subject property by more than one mile of farm land which is under relatively constant management for agricultural production.

6.0 SOCIOECONOMIC ENVIRONMENT AND IMPACTS

Kunia Village is the only characteristic community in the vicinity of the subject property. Other residential areas are found in Wheeler Army Airfield and Schofield Barracks; however, military families are different from a socioeconomic perspective. Kunia Village is the only residential area within the Zip code. Until 2010 all of the housing units were owned by Del Monte Hawaii. By 2010 Del Monte had withdrawn from the Hawaii Market and Kunia Village was in transition to management by Hawaii Agriculture Research Center (HARC) and its subsidiary. Many of the former Del Monte employees had not yet found employment and many had moved away. Many of the Del Monte retirees remained and still reside in Kunia Village.

Table 3: ZIP Code 96759 2010 Census Demographics

2010 Population:	457
Households per ZIP Code:	109
Average House Value:	$0
Avg. Income Per Household:	$31,875
Persons Per Household:	4.19

The population of the State of Hawaii was 1,360,301 in 2010, which represents an average annual growth rate of 1.2% from 2000 to 2010 (US Census Bureau 2010). This compares with an average annual growth of 0.9% for the remainder of the nation. The vast majority of Oahu neighborhoods lost population over the past decade. Few neighborhoods lost as many as Kunia (31.4%). During this decade Del Monte Hawaii left Hawaii and during 2010 the transition between Del Monte and HARC was still on-going. The James Campbell Estate was also liquidating assets but the new buyers had not made structural changes to allow them to put land back into service. Many farm workers left the area to look for new employment; in some cases, it was the first time that Del Monte was not their employer and landlord.

6.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

The ground surface across the entire parcel has been graded, filled and heavily disturbed over the past 90 years. No archaeological resources have been recorded or observed within the property boundaries. Given the extensive grading and development that exists, no such resources are expected to remain intact if any were ever present.

The areas surrounding the subject parcel do have considerable historic value. These include Wheeler Field, which was the first place attacked by Japanese aircraft on December 7, 1941. This attack and the concurrent bombing of Pearl Harbor led directly to America's entrance into World War II.

Kunia Village has sufficient historic value for placement on the State and Federal Historic Registers. The significance of Kunia Village is its representation of the pineapple industry, which during the mid-twentieth century was Hawaii's second largest industry. Kunia Camp is also associated with the California Packing Company (CPC later known as Del Monte), one of the major pineapple operators in Hawaii from its inception in 1916 until the closing of the Kunia facility in 2009.

Figure 17: Pineapple operations circa 1950

Throughout the 20th Century, the importance of pineapple in Hawaii's agricultural industry was second only to sugar. With plantations and/or canning facilities on almost every Hawaiian island, the industry was responsible for the cultivation of thousands of acres of land, the employment of thousands of workers, and the processing of millions of pineapples. In addition to the economic impact of the industry, the fruit became a powerful icon of the Territory and State of Hawaii.

*The Kunia Camp Historic District is also significant as a concentration of Plantation Style residences. The residences display the distinctive characteristics of the Hawaiian Plantation Style of architecture, which includes vertical boards (tongue-and-groove and board-and-batten) on the exterior, single-wall construction (some with girts), and pitched roofs [some hipped] with wide, overhanging eaves (*Mason Architects 2014*).*

The Kunia Camp Historic District retains its historic integrity; and the majority of its individual resources within the district are at least 50 years old.

6.2 CULTURAL IMPACTS

Cultural resources, as used in Chapter 343, HRS, refer to the "practices and beliefs of a particular cultural or ethnic group or groups". The types of cultural practices and beliefs to be assessed may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs (OEQC 1997), and may also include traditional cultural properties or other historic sites that support such beliefs and practices**.**

Cultural impact assessment studies have been completed for the project site in 2006 (NRC, 2006) and the Military areas immediately north and west of the subject property in 1998 and again in 2005 (PACNAVFACENGCOM, 1998), (NAVFAC Pacific, 2005). These cultural impact assessment studies involved interviews with individuals and groups who are knowledgeable about the proposed project area, its resources and traditional uses. Archival research was also used to

identify any traditional beliefs and customs. The findings of the cultural impact assessments include several significant features of the Central Oahu Plain but nothing of relevance within the project site.

The areas of the central plain were the site of many battles between competing Alii before the unification of Hawaii by Kamehameha I. These areas were thought to be continuously vegetated by grasslands with only sparse tree covering. They were probably chosen because of the open nature, which allows for unrestricted movement of foot soldiers, the distance from the coastline, and the space to amass people for battles.

Kūkaniloko, the birthing stones are located 2.3 miles northeast of the project site. Kūkaniloko is a traditional birthing place which some historians describe as "one of the two famous places in the Hawaiian Islands for the birth of children of *tapu* chiefs" (McAllister, 1933). This tradition is believed to have been established at Kūkaniloko sometime during the 14th or 15th century by the chief Nanaka`oko and his wife, for the birth of their son Kapawa (Fornander, 1880). Today Kūkaniloko is a state monument managed by the State Office of Hawaiian Affairs. No culturally significant locations or traditional practices were identified within the boundaries or near the project site.

6.3 LAND USE

The subject property and other agricultural lands have been rated as potentially among the most productive lands in the State for diversified agriculture and as lands for production of specific high-value food crops of statewide or local importance. For example, the State Department of Agriculture's November 1977 study, Agricultural Lands of Importance to the State of Hawaii (Revised) (ALISH), indicates that the lands along Kunia Road north of Wahiawa and surrounding Mililani are unique. In addition, the University of Hawaii Land Study Bureau's December 1972 bulletin, *Detailed Land Classification - Island of Oahu*, rated productive capacity of the former sugar fields along Kunia Road, north of Wahiawa, and surrounding Mililani as predominately "B." (An "A" rating was given to the lands with the highest productivity, "E" was given to the lowest). A soil classification of "B" was given to the subject property.

Figure 18: The subject property in pineapple cultivation as was much of Central Oahu as seen in a 2006 photo that was made part of a land sales brochure by Campbell Estate.

When the former James Campbell Estate land sold its Hawaii holdings in 2008 - 2011, it was sold to agricultural companies or groups that intended to place the land into agricultural service. The exceptions to this statement are Parcel 7 and 9, which were sold to a joint venture between Actus Lend lease and the US Army to possibly establish additional military housing at Schofield Barracks and a buffer between the Army Post and civilian development. All of the parcels, including Parcel 7 are now actively utilized for crop production.

6.4 GROWTH-INDUCING, CUMULATIVE, AND SECONDARY IMPACTS

Indirect effects may include other impacts related to changes induced by the proposed action such as growth-induced changes in land-use patterns, or air and water quality impacts associated with population growth. Cumulative impacts may be defined as impacts on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes the action. A secondary impact is one that is caused by the proposed action but is removed in time or space from the project (Council on Environmental Quality, 1997).

The addition of the proposed water source in Central Oahu does not exceed the sustainable yield of the water management area, and is by State Policy the highest and best use of groundwater

resources. During ancient times the ability to produce more food led directly to the survival and population growth in the immediate area, but today greater local food production tends to displace that imported from elsewhere. The cumulative impact of this and other efforts to increase the agriculture industry on Oahu could lead to reduced food cost, increased security and additional income streams to farm workers and their families. Over the long term the cumulative effect of these positive impacts could be viewed as a growth-inducing. The primary secondary impact of the proposed action is to retain agricultural land in agriculture by providing the infrastructure to make it income producing and less likely to be converted to use other than agriculture.

This assessment finds the growth inducing, cumulative and secondary impacts to be manageable with positive impacts to the quality of life within the surrounding communities, County of Honolulu and the State of Hawaii.

6.5 REQUIRED PERMITS AND APPROVALS

The proposed action requires a Groundwater Use Permit for a Proposed New Use in a Groundwater Management Area from the Department of Land and Natural Resources, Commission on Water Resources Management (CWRM). The permit application has been prepared (Appendix A) and will be submitted to CWRM for consideration concurrently with publication of the Draft Environmental Assessment.

The Department of Land and Natural Resources must be notified on the location and specification of all reservoirs. The reservoirs will require a grading permit or Soil Conservation Plan.

The tractor shed and greenhouses will not have power and will not require building permits.

Any activity that is approved for agricultural land but not considered agriculture or accessory to agriculture may require a Conditional Use Permit.

All infrastructure improvements, including those proposed herein, require advance approval of the Hawaii Department of Agriculture.

7.0 CONSISITENCY WITH PLANS, POLICIES, AND REGULATIONS

7.1 FEDERAL POLICIES SUPPORTING THE USE OF GROUNDWATER ON AGRICULTURAL LAND

The Congressional Budget Office (CBO, 2006) reports that nationally, surface waters account for about 75% of withdrawals; in the arid West, however, groundwater sources supply a larger percentage of withdrawals than in the East. Nationwide, 40 percent of withdrawals are for agricultural use as opposed to 2% on Oahu. In the West, agriculture accounts for 74 percent of withdrawals; in the East, where irrigation is less common, agriculture accounts for 11 percent of withdrawals. Although much of the water withdrawn for agriculture is consumed in irrigation, as much as 20 percent might return to its sources, albeit altered in terms of its content. Another 40 percent of withdrawals nationwide are for thermoelectric power. Those withdrawals return most of the water, altered only in temperature, to its sources. Thermoelectric power accounts for 64 percent of withdrawals in the East and 11 percent in the West. (Hydropower in the West uses only in-stream resources, so it has no associated withdrawals.) Residential, commercial, and industrial entities account for the remaining 20 percent of national freshwater withdrawals.

The majority of federal policies on water use are for protection of endangered species in dam and watershed projects. Groundwater allocations and protection policies are primarily reserved for States.

7.2 HAWAII STATE POLICIES SUPPORTING LOW-INCOME HOUSING ON AGRICULTURAL LAND

HRS 226 "The Hawaii State Planning Act" was originally prepared in 1978. The purpose of this chapter was to prepare the Hawaii State Plan which serves as a guide for the future long-range development of the State; identify the goals, objectives, policies, and priorities for the State. **The Hawaii State Plan** was further divided into 12 functional plans that addressed the priority subjects. At the time The State Agriculture Functional Plan was prepared the State's agricultural priorities addressed measures to support plantations. At that time the Plantation communities were thriving company towns which did not need preservation or much scrutiny from government. The State's overall goals for agriculture are to (1) *promote continued viability of the Sugar and Pineapple industries and (2) continue to support development of diversified agriculture*. Diversified agriculture was defined as everything except sugar and pineapple. Each Functional Plan contains specific objectives.

Objective H of the State Agriculture Plan is to promote beneficial use of the most productive agricultural lands by:

(H-1) Provide suitable public lands at a reasonable cost with long term tenures to commercial agricultural purposes.

The proposed action occurs on State land that is provided through a long-term lease to Waikele Farms. This action is consistent with Objective H-1.

(H-2) Conserve and protect important agricultural lands in accordance with the Hawaii State Constitution.

The use of important agricultural lands is critical to their preservation. Important agricultural lands that lie fallow for extended periods have become targets for non-agricultural uses. The proposed action will restore this parcel to agricultural use and be consistent with Objective H-2.

Objective I provides for the achievement of efficient and equitable provision of adequate water for agricultural use including:
(I-1) Expand agricultural water resources statewide.

The proposed action is to construct an agricultural water source for use in growing crops on agricultural land. This action is consistent with Objective I-1.

(I-2) Improve agricultural water resource management.

Since adoption of the agricultural functional Plan, CWRM has designated and maintained control over all aquifers that are considered at risk of becoming over utilized. CWRM's permit system effectively protects the State's water resources and provides a discretionary system for approval of new uses.

HRS Chapter 205 is the Statue which defines the four different land use districts used by State law, and describes the permissible uses within each district. HRS 205-2 and section 4.5 establish the permissible use of agricultural land. The permissible uses are designed to protect valuable agriculture land from competing uses. The proposed action is for active use of agriculture lands for agriculture and thus consistent with HRS 205.

Coastal Zone Management requirements are address in HRS 205A-2, which defines the entire State as being within the Coastal Zone. Of the 11 CZM initiatives the majority apply to coastal resources which are at its closest point 9 miles to the north near Kaiaka Bay, and 6 miles to the south at the West Loch of Pearl Harbor. Drainage flows to the south and enters West Loch via Waikele Stream.

One of the objectives of the CZMA is to preserve and protect scenic open vistas. The proposed action is consistent with this objective by protecting open vistas of agriculture land in active agriculture, reducing the chances for development in non-agricultural uses. The proposed action is consistent or not applicable with the remaining initiatives.

The Office of State Planning has prepared **guidelines for sustainable development** that are based on the provisions of HRS 226 and HRS 205. Although the priority guidelines to promote sustainability are too general for detailed applicability, the 10 smart growth and livability principles are directly applicable to the proposed action. The principle most aligned with the proposed action is:

8. ***Preserve open space, farmland, natural beauty, and critical environmental areas****. Preserve natural areas that provide important community space, habitat for plants and animals, recreational opportunities, places of natural beauty, and critical environmental areas. Protect farm and agricultural lands and promote locally grown foods.*
OSP also prepared the planning document entitled ***Increased Food Security and Food Self-Sufficiency Strategy*** to address objectives, policies and actions to increase the amount of locally grown food consumed by Hawaii's residents. The specific goals of the strategy are to:

-Increase Demand for and Access to Locally Grown Foods
-Increase Production of Locally Grown Foods
-Provide Policy and Organizational Support to Meet Food Self-Sufficiency Needs

The first action item listed under the production of locally grown food strategy is:
To increase production of locally grown foods, improve agricultural infrastructure including agricultural parks, irrigation systems and distribution systems/facilities.

The proposed action is to construct and operate a water sources and distribution system immediately south of Wheeler Field. This action is consistent with the strategy set forth in the above-referenced planning document.

7.3 CITY AND COUNTY POLICIES SUPPORTING AFFORDABLE HOUSING ON AGRICULTURAL LAND

The Proposed 2013 **General Plan for Oahu** (DPP 2012) proposes overarching policy goals for Oahu. The proposed action is supported by the following policies:
Objective C: To ensure the long-term viability and continued productivity of agriculture on Oahu

Policy 1
Foster a positive business climate for agricultural enterprises and agricultural entrepreneurs to ensure the continuation of agriculture as an important component of Oahu's economy.
Policy 4
Remove unnecessary impediments to developing, marketing and distributing locally grown food and products.
Policy 5

Promote small-scale farming activities and other operations, such as truck farming, flower growing, aquaculture, livestock production, taro growing, and subsistence farms
The proposed action promotes and protects the use of important agricultural land by providing needed infrastructure for farming.

The **Central Oahu Sustainable Communities Plan** was adopted in 2002 with a planning horizon of 2025. The Plan's principals are valid and the recommendations support the proposed action.

PLANNING PRINCIPLES
Planning principles include the retention of important agricultural lands.

GUIDELINES
Facilities necessary to support intensive cultivation of arable agricultural lands should be permitted.

The proposed action involves the use of private funds to construct essential agricultural infrastructure on State land. The improvements are required to support expanded agricultural production of farm commodities to supply local demand.

The proposed action is supported by Federal, State, and County policy declarations.

8.0 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Affected Environment	**Impact Level of Concern**	**Impact and Mitigation**
Surface Water Resources and Drainage	Low	*Impact:* Potential stormwater runoff during construction *Mitigation:* Soil Conservation Plan in Place. BMPs prior to grading
Groundwater Resources	Low	*Impact:* Use of limited groundwater, but used for priority purpose *Mitigation:* Limit pumping volumes to less than sustainable yield
Seismic and Geological	No	None
Soils and Agriculture	Low	*Impact:* potential soil loss from tillage, new agricultural development *Mitigation:* Soil conservation planning, with BMPs
Flora and Fauna	No	*None:* Area is previously disturbed and dominated by invasive species
Air Quality	No	No emissions sources. Fugitive dust minimized by BMPs
Visual Character	No	Little change from the existing conditions
Noise	No	No perceptible noise from proposed action
Odor	No	None
Social	Positive	*Impact:* No employment opportunities in Central Oahu
Historical and Archaeological	No	No historical or Archeological resources identified
Economic	Positive	*Impact:* Local food production keeps money in Hawaii
Cultural	No	No traditional practices or important cultural sites identified
Public Services	No	No Public facilities or services required
Roads and Traffic	No	Negligible traffic associated with the proposed action
Consistency with Govt. Plans and Policies	Consistent	Water and agriculture supported by Federal, State and Local Plans
Irretrievable Resources	Positive	*Impact:* local agriculture displaces imports, reduces fossil fuel expenditure

9.0 DETERMINATION OF SIGNIFICANCE

In determining whether an action may have a significant effect on the environment under HRS 11-200, the proponent must consider every phase of a proposed action, the expected consequences, both primary and secondary, and the cumulative as well as the short-term and long-term effects of the action. An action shall be determined to have a significant effect on the environment if it:

1. *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;*

   The proposed action would not result in an irrevocable commitment, loss or destruction of any protected natural resource. No threatened or endangered species were identified within the development area. Previous archeological studies concluded that there is no evidence of traditional practices or cultural artifacts within the area of the proposed action.

2. *Curtails the range of beneficial uses of the environment;*

   No new natural areas will be developed in the proposed action, but former agriculture land will be returned to service. The proposed action will benefit local agriculture, which is arguably one of the best uses of the environment when considering the alternatives in an isolated and somewhat crowed environment.

3. *Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;*

   The proposed action is consistent with the County General Plan, and the Central Oahu Functional Plans.

4. *Substantially affects the economic welfare, social welfare, and cultural practices of the community or State;*

   The proposed action has beneficial impacts on the social and economic welfare of the County and State.

5. *Substantially affects public health;*

   Public facilities and services are adequate to manage the increase in population within Kunia Village. The proposed action benefits public health by supporting local agriculture.

6. *Involves substantial secondary impacts, such as population changes or effects on public facilities;*

   Secondary impacts are defined as those displaced in time or space from the proposed action, yet resulting directly from the action. Increasing the supply of locally grown food is not a driver for increased population density since it only displaces imported food.

7. *Involves a substantial degradation of environmental quality;*

   Temporary impacts associated with construction of the well will include minor amounts of dust and noise, neither of which will be perceptible above background levels.

8. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;*

   The proposed action is not part of any other development and no commitment for larger actions is required.

9. *Substantially affects a rare, threatened, or endangered species, or its habitat;*

   The area is previously disturbed and historically cultivated for pineapple. Special status species that depend on the parcel were not identified.

10. *Detrimentally affects air or water quality or ambient noise levels;*

    The proposed action is not expected to result in degradation of the quality of air, water or other measurable aspect of the environment.

11. *Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;*

    The project site is within a traditionally used agricultural area. Land disturbance over more than 100 years has defined the biological communities that are present. These traditional farm lands are not normally considered environmentally sensitive areas.

12. *Substantially affects scenic vistas and view planes identified in county or state plans or studies; or,*

    The scenic vistas and unique view planes, and unique community character will be preserved by the proposed action.

13. *Requires substantial energy consumption.*

The proposed project will require fossil fuel consumption during construction and increase electrical power consumption during operation. The quantities of both sources are minimal by community standards and these services are available using existing infrastructure.

Approximately 85% of the food consumed in the State of Hawaii is imported from elsewhere. If Hawaii suffered an interruption of air or sea traffic local supplies of many essential items would last less than 2 weeks. Among the priorities of Governor Ige and previous administrations are promoting development of locally-produced food and energy. These priorities were well expressed in the 2013 State-of-the-State address when Governor Abercrombie declared:

"As we strive to be more self-sufficient and decrease our dependence on imported foods, we must give local farmers the tools that they need to overcome the challenges that face their industry."

The proposed water source will:

- Increase local production of food, and displace imported food.
- Utilize agricultural land for low-impact agriculture,
- Provide a significant amount of permanent agribusiness employment, and
- Pay income tax to the State.

The proposed farm development is consistent with the Oahu general plan and the Central Oahu Functional Plans which are intended to promote self-sufficiency in local agriculture and maintain a rural lifestyle in Central Oahu. Negative impacts associated with the proposed action are limited to irretrievable commitment of capital and fossil fuels. The positive impacts on the public interest far outweigh those which are negative.

9.1 ANTICIPATED FINDING

Based on analysis of the 13 significance criteria listed above, the proposed action is not expected to result in significant adverse environmental impacts when conducted within the constraints of the required plans and permits. Comments received from the public and various agencies during this DEA review period, will provide new information, which will be considered in the final conclusion of this assessment. Pending receipt of these comments from agencies and interested parties, this assessment anticipates reaching a finding of No Significant Impact.

10.0 PREPARERS

This Assessment was prepared by North Shore consultants, LLC., David Robichaux Project Manager. Significant assistance was provided by the proponent Larry Jefts, as well as Charley Ice, of the Department of Land and Natural Resources. Ms. Linda Murai and Mr. Randy Teruya of the Hawaii Department of Agriculture also provided a much needed review of the document.

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Appendix A:
Draft application for groundwater use in a Groundwater Management Area

Groundwater Use Permit Application

Waikele Farms, Inc.

Parcel # 9-4-012:002

Kunia, Oahu, Hawaii

March 2016

Groundwater Use Permit Application
Waikele Farms, Inc.
Parcel # 9-4-012:002
Kunia, Oahu, Hawaii

Kunia, Oahu, Hawaii

Prepared for:

Mr. Larry Jefts, President
Waikele Farms, Inc.
PO Box 27
Kunia, Hawaii 96759

Prepared by:

North Shore Consultants
PO Box 790
Hale`iwa, HI 96712

June, 2015

1. PROJECT LOCATION

The subject property is located in the Ewa District of Oahu, adjacent to the south boundary of Wheeler Army and west of Waikakalaua Gulch (Figure 1,2). Parcel 9-4-012:002 (487 acres) is bounded on the east by Waikakalaua Gulch, on the north by Wheeler AAF Military Reservation; on the west by Kunia Road, and on the south by agricultural land owned by Island Palms Communities and Robinson Trust.

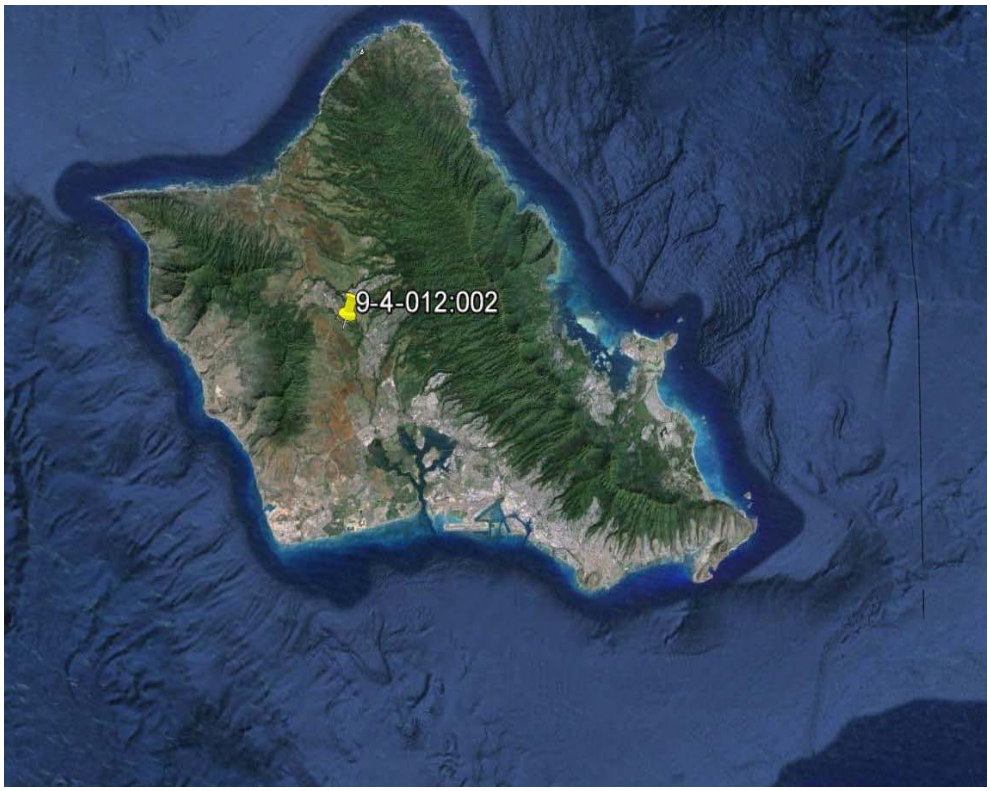


Figure 1: Site location on the Island of Oahu

The center of the parcel is located at Latitude **21° 28.000'(N)** and longitude **158° 2.500 (W).** Access is directly from Kunia Road (Figure 1).

The subject property is in a rural setting dominated by large agricultural parcels used for crop production, animal husbandry or agricultural research. The one exception is the Military reservation at Schofield Barracks and Wheeler AAF. The entire parcel is zoned Ag-1, which is the designation for prime agricultural lands and within the State Agricultural District. The land in this vicinity is relatively flat without the gently rolling hills that characterize much of Central Oahu. The area is bisected by deeply eroded stream valleys. The closest civilian residential area is Mililani, immediately across Waikakalaua Gulch. The Mililani Golf Course is directly across from the property. Kunia Camp is ½ mile to the southwest and Military housing on Schofield Barracks is 1.3 miles to the northwest.

Information obtained from The Commission on Water Resources Management (CWRM) indicates that the parcel is located within the Wahiawa Aquifer Section, approximately 1 mile southwest of the intersection between the Wahiawa, Mokuleia and Waialua Aquifer sections as shown in Figure 3.

2. PROJECT DESCRIPTION

The subject property is owned by the State of Hawaii and leased through the Agribusiness Development Corporation. It was former Pineapple land until Del Monte withdrew from the Hawaii market in 2009. The land has been fallow since that time. As of the start of 2015 the subject property is being leased to Waikele Farms, Inc. Waikele Farms is one of several operating entities that supplies the majority of local produce to Hawaii's consumers. They are active on both Oahu and Molokai and have been farming continuously for the past 43 years.

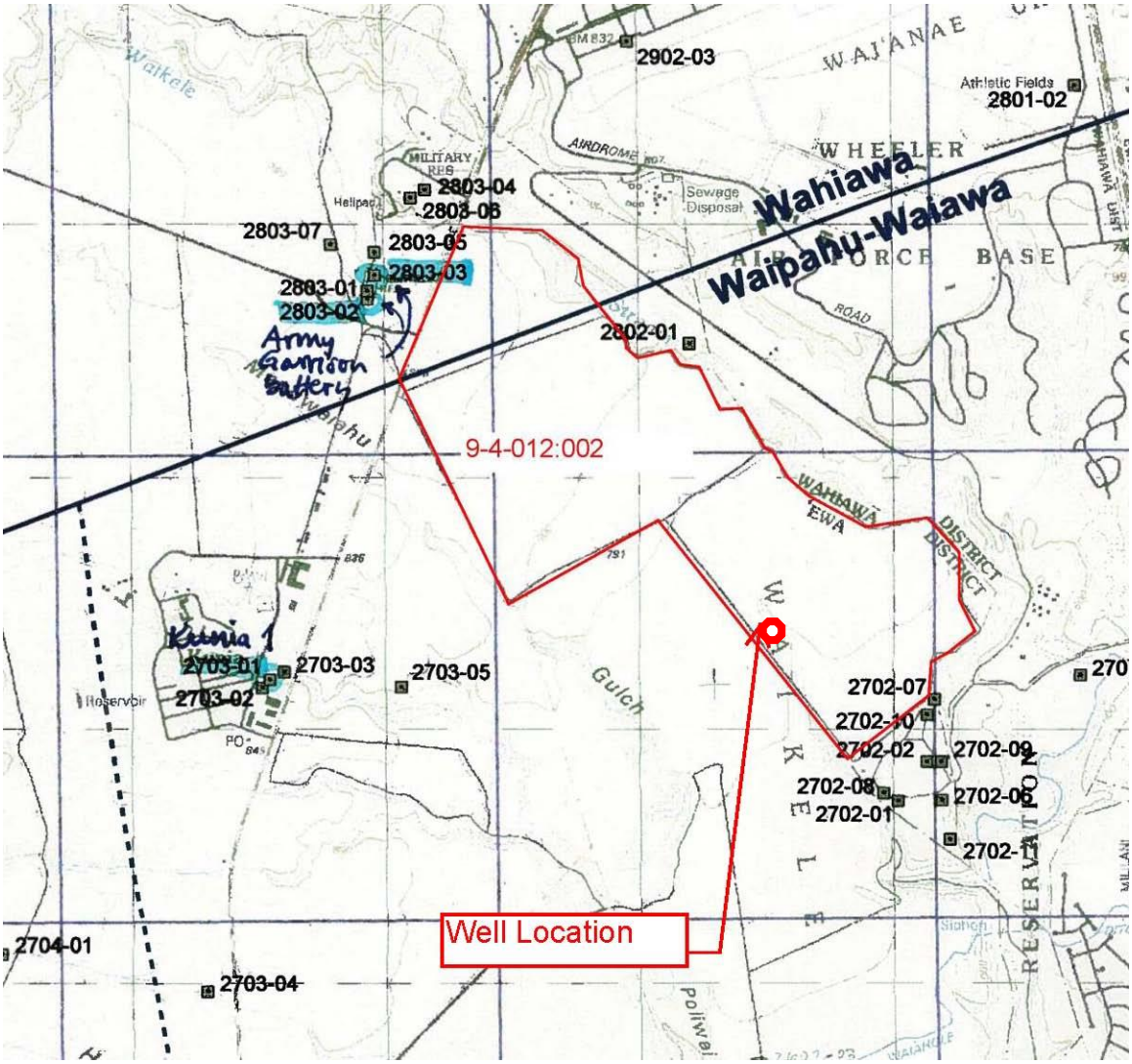


Figure 3: Proposed new source location within the Waipahu-Waiawa Water Management Area. The proposed well location is to be placed at

Lat: 21° 27.574'N Lon: 158° 2.348'W

The subject parcel covers 487 acres, and is unusual in that the entire parcel is arable. The property will be used to cultivate some combination of cucumbers, tomatoes, bell peppers, watermelons, or bananas.

It is critical to the operation to have continuous access to clean water for irrigation. Without a guaranteed supply the parcel cannot be used for farming. Approximately 1,217500 gallons of water per day will be required to supply crops during dry periods. Because of the specific requirements imposed by food quality regulations and wholesalers all water used within the farm must be potable and free of pathogens. None of the water is destined for domestic use.

3. PUBLIC INTEREST

Approximately 85% of the food consumed in the State of Hawaii is imported from elsewhere. If Hawaii suffered an interruption of air or sea traffic local supplies of many essential items would last less than 2 weeks. It has been the common practice of many local families to stockpile rice, toilet paper and other essentials during hurricane season or labor disputes.

Among the priorities of Governor Ige and previous administrations are promoting development of locally-produced food and energy. These priorities were well expressed in the 2013 State-or the State address when Governor Abercrombie declared:

"As we strive to be more self-sufficient and decrease our dependence on imported foods, we must give local farmers the tools that they need to overcome the challenges that face their industry."

The proposed water source will:

- Increase local production of food, and displace imported food.
- Utilize agricultural land for low-impact agriculture,
- Provide a significant amount of permanent agribusiness employment, and
- Pay income tax to the State.

The proposed farm development is consistent with the Oahu general plan and the central Oahu functional plans which are intended to promote self-sufficiency in local agriculture and maintain a rural lifestyle in Central Oahu. Negative impacts associated with the proposed action are limited to irretrievable commitment of energy, capital and fossil fuels; a slight increase in traffic; and visual impacts of building farm buildings where there are now none. The positive impacts on the public interest far outweigh those which are negative.

4. SITE GEOLOGY

The subject property is composed mainly of Wahiawa silty clay (WaA) (US Soil Conservation Service, 1972).

The Wahiawa series soils support vegetation including crops such as vegetables, grasses, low shrubs. This soil type tends to be quite slippery when wet and dusty when dry.

The upper 100 to 200 feet of soil beneath the site is composed of saprolite clays, which are weathered-in-place basaltic rock. Beneath the saprolites are lava zones which alternate between clinker, rock and cinder. Three types of groundwater exist on Oahu: (1) basal groundwater, and (2) dike impounded, and (3) perched water. The site lies above the Schofield High Level Water Body (SHLWB) The SHLWB is is a dike-impounded aquifer bounded on the east and west by other dike-impounded water and on the north and south by basal groundwater. Perched water may ocurr beneath the site as well. Lower permeable soils, possibly dikes or buried ridges physically separate the groundwater systems from each other. The SHLWB has a very high hydraulic conductivity and transmisivity. The depth to groundwater is approximately 600 feet below ground surface or 270 feet above mean sea level.

5. Environmental Condition

No records of any environmental impairments were discovered during a search of publicly available records; however the area is generally suspected to contain low levels of pesticides EDB and DBCP as a result of its many years in production of pineapple. Groundwater in the vicinity may contain small amounts of organic solvents (TCE), petroleum, and/or the pineapple pesticides EDB and DBCP.

At least three accidental releases of pesticides, fuel, and organic solvents have impacted These have had a far greater impact on groundwater quality than the general use of pesticides or other potential contaminants. These releases illustrate the importance of secondary containment and safety controls applied to industrial uses of potentially hazardous materials when the site is located above a valuable and irreplaceable groundwater aquifer.

Del Monte Kunia Wells: Contamination of the Waipahu section was first identified in the early 1980s as a result of a vehicular accident at the Del Monte Hawaii Plantation. Fumigants, such as ethylene dibromide (EDB), 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dichloropropane (DCP) were used from the early 1940s until 1983 to control nematodes that infest the pineapple root. On April 7, 1977, there was an accidental spill of approximately 495 gallons of ethylene dibromide (EDB) within approximately 60 feet of the Del Monte Well in Kunia Village, which provided drinking water to about 700 people within Kunia Village. The well was tested one week after the spill and no contamination was detected. It took several years for the pesticide to migrate to groundwater.

In 1980, the Hawaii Department of Health (HDOH) initiated an investigation to determine whether the fumigants used in pineapple agriculture had contaminated drinking water wells on Oahu. As part of the investigation, the Del Monte Kunia well was sampled. The results indicated the presence of EDB and 1,2-dibromo-3-chloropropane (DBCP). The HDOH ordered the well removed from service. After an investigation required by the US EPA the site was placed on the Notion Priorities List, commonly known as a superfund site. As of 2015, An 11-acre portion of the Kunia Village continues to be remediated by Del Monte Corporation under a consent decree with the United States. The source area is 1.25 miles to the southwest, across and slightly down-gradient from the proposed well location. Remedial actions begun in the mid-1980s have been suspended for a time indicates that the

contaminate levels are statistically indistinguishable from background levels (Golder and Associates, personal Communication, 2015). A contaminant plume would be expected to migrate to the south toward Pearl Harbor from the source area, and is not likely to influence groundwater beneath the proposed new well site.

Schofield Barracks Deep Well: In 1985, the Hawaii Department of Health informed the Army that high levels of volatile organic compounds (VOCs) including Trichloroethylene or TCE contaminated wells that supply drinking water to 25,000 people at Schofield Barracks and surrounding areas. After an initial investigation the US EPA placed Schofield Barracks on the National Priorities List, making it Hawaii's next Superfund Site. An extensive investigation was conducted to determine the source or sources of solvents in the groundwater, but that investigation was inconclusive. In the following year, the Army began removing the contaminants from the water by installing an air stripping facility. Since 1985 many thousands of gallons of organic solvents have been removed from the Schofield High level water body; yet wells within three miles of Schofield Barracks in both the Central aquifer and the Waipahu-Waiawa section of the Pearl Harbor aquifer contain contamination and require aeration treatment to remove volatile organic solvents. With aeration the groundwater in these wells meet potable water standards. The Del Monte Kunia Well does not contain TCE, but those approximately 1 mile to the North used by the Kunia Water Association do have measurable quantities of TCE and Trichloropropane (TCP).

Waikakalaua Fuel Storage Annex: The Waikakalaua Fuel Storage Annex (WFSA) consisted of three large fuel storage tanks and several smaller ones that were built to supply Pearl Harbor with gasoline and aviation fuel. WFSA is located approximately 2000 feet to the southeast of the proposed well site. Records indicate that over the 50 year period of service 18 billion gallons of fuel were pumped into the facility and only 14 billion were withdrawn. In the 1990s the Air Force identified 24 points of known or suspected leakage from the system. Although a floating plume of petroleum is known to exist beneath the WFSA nearby wells have not shown levels of contaminants above the MCLs. Bioventing has been employed to remediate fuel in groundwater near the site.

Summary: Pineapple pesticides are found in many of the groundwater management units as a result of previous agricultural practices. Ethyl-Dibromide (EDB) and Di-benzo-chloropropane (DBCP) are the major contaminants of concern. Low levels of these contaminants are now considered "background" in many parts of the island and are expected to be found in the proposed well. These may have originated from normal and legal application before these pesticides were banned from use is the United States. The spill near the Del Monte Kunia Wells have probably not migrated far enough across gradient to impact the proposed new source well. The contaminant levels are expected to be below the levels that would restrict it use for agricultural practices of drip, furrow, spray irrigation.

Organic solvents from the Schofield high level water body may overflow into the Waipahu-Waiawa groundwater management unit of the Pearl Harbor aquifer, but these are also not expected to be found in concentrations that require remediation for the proposed irrigation use.

WFSA is the closest know release to the proposed well site and has influenced its location. A plume of petroleum that is presumed to migrate south toward Pearl Harbor, while the new well site is 0.4 miles west and slightly up gradient from the storage tanks. Fuels from WFSA are also not expected to impact the well location.

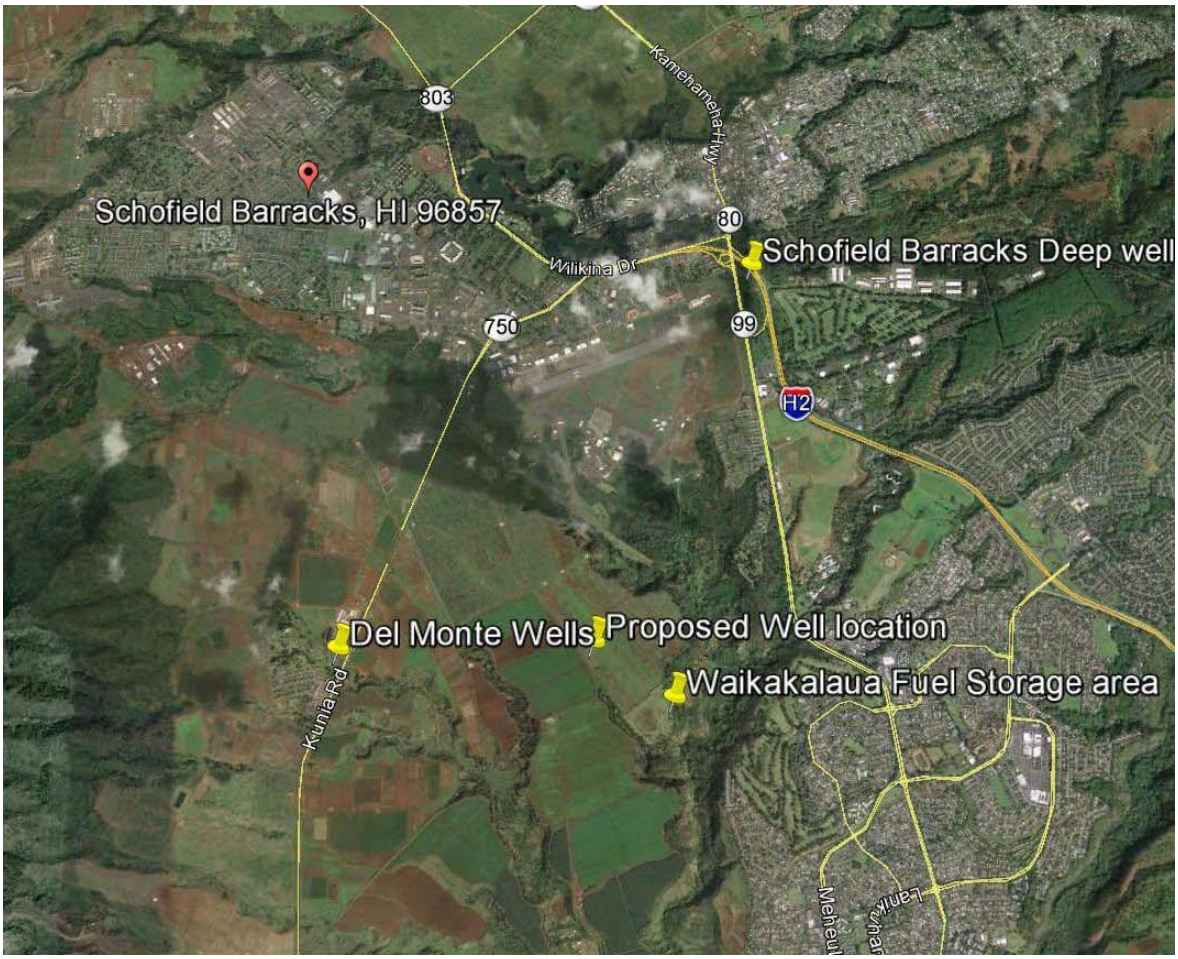


Figure 4: Aerial Photograph of the potential sources of contamination near the proposed new source well

Appendix A

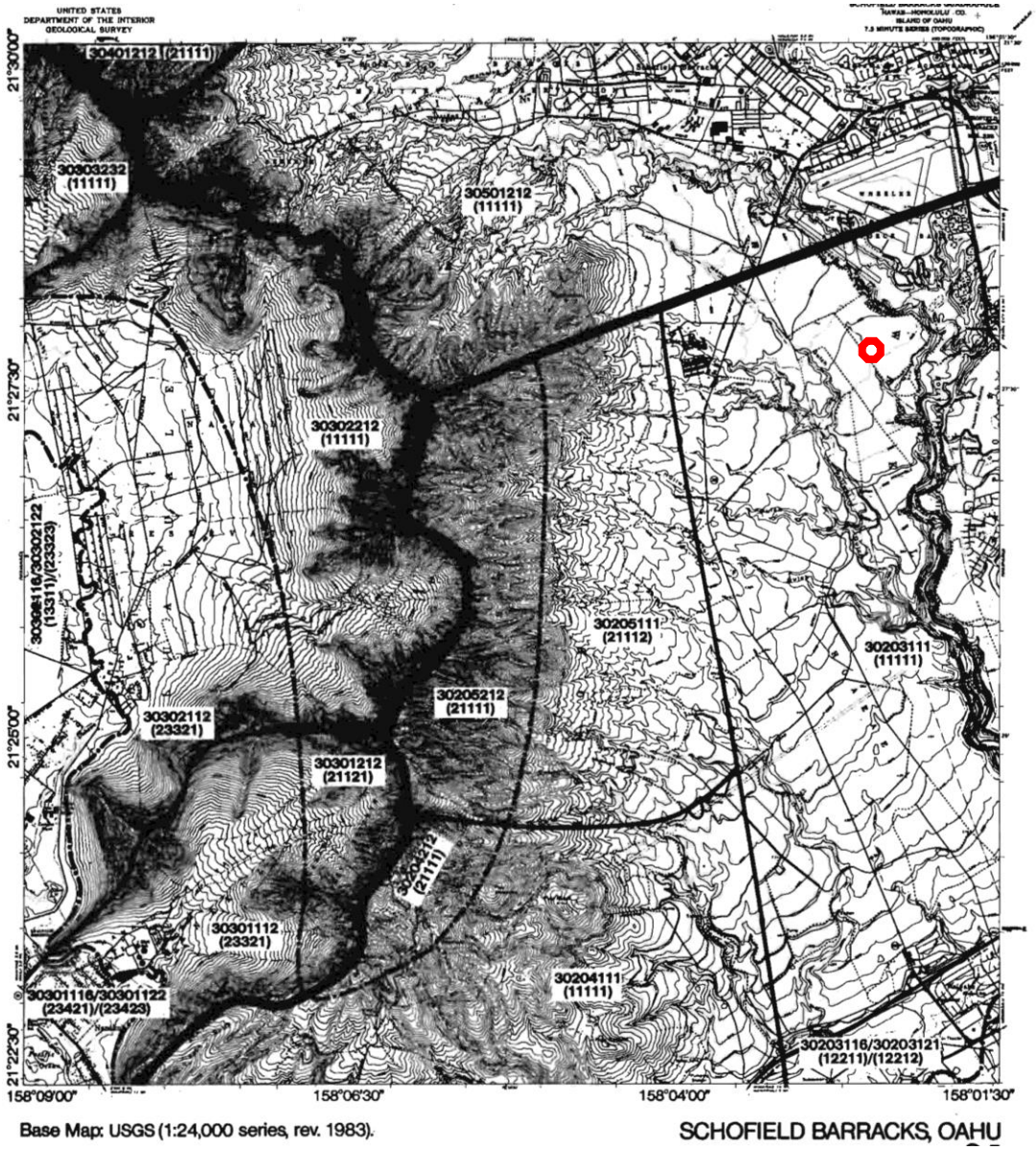
Site Photographs

Plate 1: The subject property on June 26, 2015 looking southeast from the intersection of Hauula Street and Kunia Road. The trees shown above are ¾ mile away. The well site is approximately 1.2 miles from the photo location slightly to the left of the trees.

Plate 2: Telephoto shot of historic aircraft hangers on Wheeler AAF looking NE from the site entrance. Note watermelon plantings with sorghum windbreaks

Plate 3: Looking NW from the project entrance toward the NSA tunnels and the site of KWA wells, which are approximately ½ mile to the NW.

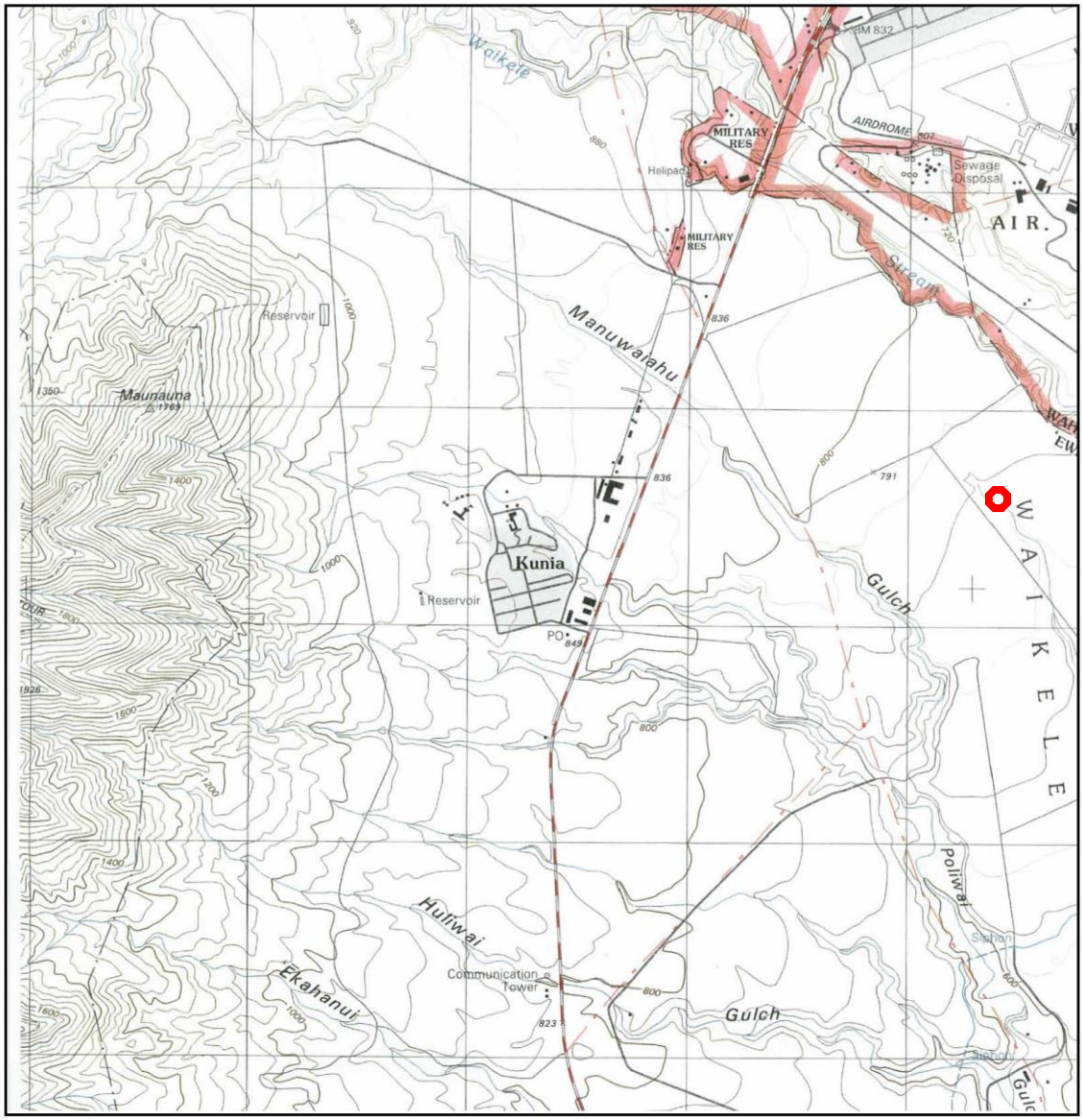
Appendix B
Topographic Maps



Base Map: USGS (1:24,000 series, rev. 1983).

SCHOFIELD BARRACKS, OAHU

Historical Topographic Map



N	TARGET QUAD NAME: SCHOFIELD BARRACKS, HI MAP YEAR: 1998 SERIES: 7.5 SCALE: 1:24,000	SITE NAME: Del Monte Hawaii Plantation ADDRESS: 92-1700 Kunia Road Kunia, HI 96797 LAT/LONG: 21.4592 / 158.058	CLIENT: David Robichaux CONTACT: Dave Robichaux INQUIRY#: 2115252.4 RESEARCH DATE: 01/09/2008